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The Oliver-Sharpey Lectures
ON
THE CEREBRO-SPINAL FLUID.

Delivered before the Royal College of Physicians of London on April 22nd and 29th, 1910,

BY F. W. MOTT, M.D. LOND., F.R.C.P. LOND., F.R.S.,

PATHOLOGIST TO THE LONDON COUNTY ASYLUMS; PHYSICIAN TO CHARING CROSS HOSPITAL; AND FULLERIAN PROFESSOR OF PHYSIOLOGY AT THE ROYAL INSTITUTION.

LECTURE II.[1]

Delivered on April 29th.

THE PATHOLOGY OF THE CEREBRO-SPINAL FLUID.

MR. PRESIDENT AND FELLOWS OF THE COLLEGE,—In my last lecture I endeavoured to point out to you the physiology of the cerebro-spinal fluid. I discussed its physical and chemical properties, its source, its destination, and its functions. To-day I propose to consider the pathology of the cerebro-spinal fluid.

I will throw on the screen a lantern slide indicating the pathological conditions which may occur in the fluid.

TABLE I.—*Cerebro-spinal Fluid and Pathological Conditions.*

Properties, substances, &c.	Normal.	Pathological.
Appearance.	Clear, like water.	Serous, turbid, purulent, fibrinous, yellow, red, brown.
Specific gravity.	1·004–1·007.	Increased.
Reaction.	Alkaline.	Alkaline.
Tension.	60 drops per minute.	Hypertension, Hypotension.
Cryoscopy.	−0·55°.	Hyper- Hypo-
Permeability of subarachnoid space.	*Nil.*	Variable and unstable.
Presence of drugs.	—	Occasional instances.
Toxicity.	*Nil.*	It does exist, but rare.
Virulence.	*Nil.*	Sometimes marked.
Chemical Alterations.		
Proteins.	Trace globulin. No albumin.	Excess globulin, albumin, nucleo-protein.
Lipoids.	*Nil.*	Cholesterol. Splitting products of lecithins and sphingomyelin.
Sugar.	0·15–0·18%.	Excess in diabetes. Probable decrease in dementia præcox.
Urea.	0·15%.	Excess in uræmia.
Choline.	*Nil.*	Probable trace in acute nervous degeneration.
Chlorides.	0·6–0·7%.	—
Carbonates.	0·13%.	—
Potassium salts.	0·03% KCl.	No appreciable alteration.

PROPERTIES, SUBSTANCES, &C.

First as regards its physical properties. Even in marked pathological conditions, such as general paralysis of the insane, the fluid may appear clear like water, and only on further investigation may its pathological changes be discovered. Occasionally, however, the fluid may be turbid, purulent, serous, fibrinous; its colour may be yellow, being tinged with bile, red from the presence of blood, or brownish-red from the presence of altered blood. In my experience, however, which is a large one, I have very seldom seen the fluid other than like clear water, excepting always the presence of blood from the puncture of a small vessel during the performance of the operation. There is little to be said about its specific gravity, nor about the reaction. A rough estimate has been made of the tension by the number of drops per minute; 60 drops is considered the normal average. With hypertension an increased number of drops will occur.

As regards the rest of the table there is little to be said except as to the presence of drugs. As a rule drugs do not pass into the cerebro-spinal fluid, and most observers have not confirmed Majendie's original observations relating to the passage of potassium iodide into the cerebro-spinal fluid, a fact upon which Majendie laid great stress as showing the manner in which this drug benefited in such a marked degree certain diseases of the nervous system. Recently an important observation has been made by Ager. He has obtained satisfactory results following the administration of urotropine in meningeal affections; the drug is said to be excreted in the cerebro-spinal fluid in half hour to one hour after ingestion, and to exert a marked antibacterial effect. It was first employed in a case of cerebro-spinal fistula following trephining for cerebral tumour, in which the discharge became purulent. After the administration of 30 grains daily for a week the temperature became normal and recovery ensued. Experiments made on animals have been confirmatory. It is known that tetanus toxin does not pass into the cerebro-spinal fluid, but to this I have already referred in my first lecture. I may, however, remark that we should not expect the tetanus toxin to be eliminated by the choroidal gland, but from the capillaries in the nervous substance. Here the affinity of the toxin for the nervous matter would exert itself immediately. Upon the escape of the toxin from the blood-stream there should be in consequence no toxin free to pass into the subarachnoid space from which the fluid is withdrawn.

CHEMICAL ALTERATIONS.

I will now pass on to certain chemical alterations, dwelling more especially upon those to which we have given attention in the laboratory at Claybury.

Proteins.—The amount of protein in normal cerebro-spinal fluid is especially low (about 0·03 per cent.); serum-globulin may be present in slight amount, but albumin is absent. In acute and chronic inflammatory conditions, in fact in all conditions where there is leucocytosis, there is excess of globulin, and albumin and nucleo-proteins are present. In cases of progressive degeneration, in spite of the large excess of fluid, the amount of proteins is found to be greatly increased. This excess consists of globulins, nucleo-proteins, and a small amount of albumin, the greater part being coagulable by heat between 73°–80° C. The excess of globulin is the most marked, and Noguchi describes the following method for its detection in a small quantity of *blood-free* cerebro-spinal fluid. Boil for a few seconds two parts of the cerebro-spinal fluid with five parts of a 10 per cent. butyric acid solution (in 0·9 per cent. sodium chloride solution); then add one part of normal sodium hydrate solution (4 per cent.) and boil again briefly. Noguchi states that the fluid of parasyphilitic cases gives a granular or flocculent precipitate on allowing the tube to stand for a short time, and that cases of alcoholic psychosis, dementia præcox, imbecility, epilepsy, and many other non-specific diseases do not give any precipitate, but that cases of tuberculous meningitis, pneumococcic meningitis, and epidemic cerebro-spinal meningitis give an enormous amount of precipitate. I have applied this test to a considerable number of fluids, and have obtained a positive reaction in many non-specific cases, in fact, in all cases of dementia, whether non-specific or specific, and have found that the amount of precipitate is proportional to the degree of degeneration of nervous tissue, being most marked in the progressive degeneration of general paralysis of the insane. Another test for the globulin present consists in allowing the fluid to flow gently on to the surface of a saturated solution of ammonium sulphate, when a characteristic white ring appears which intensifies on standing. A rough indication of the excess of protein can also be obtained by precipitating the total protein content of the cerebro-spinal fluid with three times its volume of absolute alcohol after rendering it faintly acid with acetic acid.

Lipoids.—In the normal fluids no lipoids are present, but in degenerative conditions of the nervous system, whether primary or secondary, lipoids are present in the form of cholesterol, or, as it was formerly termed, cholesterin, an alcohol of the terpene series containing neither phosphorus nor nitrogen. This substance, the method for detecting

[1] Lecture I. was published in THE LANCET of July 2nd, 1910, p. 1.

which I shall point out presently, we have found present in practically all cases of general paralysis and chronic dementia. Generally speaking, the amount present, as shown by the intensity of the colour reaction, is proportional to the amount of wasting. It is of interest to note that frequently in cases of chronic dementia and chronic wasting diseases of the brain and spinal cord cholesteatomata of the meninges are found, and I have even seen little plates and nodules of a cholesterin-containing substance. The term cholesteatoma was given to those bodies owing to the fact that crystals of cholesterol are often found in their centre. Besides cholesterol there are phosphatides, the result of cleavage products of the lecithins and sphingomyelin.

The presence of lipoids is of interest and importance because they are indicative of wasting of the nervous structure. Moreover, they are of importance in connexion with the Wassermann reaction. Pighini asserts that cholesterol is essential for the Wassermann reaction, but inasmuch as we have found it in the fluid of diseases which do not give the Wassermann reaction, I do not agree with this statement. It seems much more likely that the Wassermann reaction—a subject to which I shall allude much more fully later—is connected with a particular form of eu-globulin.

Sugar.—The quantity of sugar varies in amount. Probably the normal quantity in fluid withdrawn by lumbar puncture is 0·15 to 0·18 per cent. If we could obtain it from the subarachnoid space without admixture of the fluid as it is secreted by the choroid plexus, it would possibly show a higher percentage, approximating that of the blood. It has long been known that the sugar is increased in diabetes, and that it diminishes under the influence of treatment. The relatively small percentage of sugar in the cerebro-spinal fluid of cases of dementia præcox is interesting, and if in a large number of cases we find this diminished quantity prevails, the fact might be correlated with the clinical symptoms of this disease.

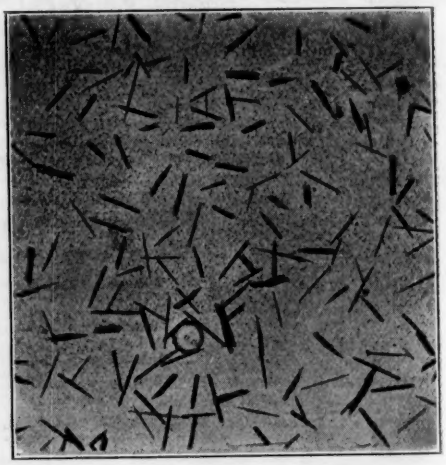
Urea.—I have not made any estimations of urea. The normal quantity is 0·15 per cent., and numerous observers have shown that there is an excess in uræmia.

Choline.—Professor W. D. Halliburton and I made a number of observations tending to show that choline occurs in the blood and cerebro-spinal fluid in conditions where a large amount of nervous tissue was undergoing degeneration. The existence of choline was demonstrated by physiological and micro-chemical tests. I am, however, of opinion from further observations that the micro-chemical tests employed—i.e., the formation of choline platino-chloride crystals—were unreliable, and that the crystals we obtained were more often potassium and ammonium salts; moreover, a number of post-mortem fluids were used for our observations, and in the laboratory we have found, using the periodide test (investigated by Rosenheim), that a very small quantity of fluid obtained from any post-mortem within a comparatively short time of death gives the test denoting the presence of choline or some substance from which choline is easily dissociable. We have been unsuccessful in obtaining the test in fluids obtained during life, even in the cases of general paralysis. A large number of papers have appeared on this subject, and the points under dispute are (1) the reliability of the tests employed; and (2) whether the substance present is really choline or some other similar or even dissimilar product of the cleavage of the complex phosphatide molecules. The questions are difficult to settle owing to the small quantity of the substance present in the fluid, but it would appear that, although choline may be split off from the phosphatide molecule during the course of active degeneration of nervous tissues, it cannot exist as such in the alkaline cerebro-spinal fluid. However, as our knowledge regarding the exact chemical composition of the complex substances of nervous structures increases, we may be able to ascertain the nature of the cleavage products of these substances in nervous degeneration.

I may remark that the potassium salts which are present in relatively so large amount in brain tissue, and which the experiments of Macdonald would suggest as being increased in the fluid in cases of degenerative destruction of the nervous system, are not appreciably altered in amount.[2] This does not prove, however, that the potassium salts do not pass into the cerebro-spinal fluid and blood and that they are not increased, for it is extremely difficult to estimate differences where such small quantities have to be dealt with. Moreover, seeing that the quantity of potassium salts is approximately the same as the blood, any increase would tend to diffuse.

There is little more to be said about the chemical alterations, but I will throw on the screen an outline of a rough method for the chemical examination of the cerebro-spinal fluid. Ten cubic centimetres of the centrifuged fluid, after examination for cells has been made, are taken and rendered faintly acid with acetic acid. Three cubic centimetres of absolute alcohol are added and the whole gently heated on a water bath for 15 minutes. After standing overnight it is again warmed and filtered. The amount of protein can be approximated at sight or weighed on a tarred filter-paper or Gooch crucible, the amount of ash being subtracted from the total weight of protein. The filtrate is rapidly evaporated to dryness at a low temperature, the residue is moistened, and a smear transferred on the end of a glass rod to a slide, and one drop of a saturated solution of iodine in 10 per cent. potassium iodide is added. The mixture is now watched under the microscope, *when, if choline is present, brownish-black rectangular plates of choline periodide will be formed.* (Fig. 10.) The moisture is removed from the residue by evaporation, and another extraction with absolute alcohol is made. The filtered extract is evaporated *to dryness* and extracted with hot chloroform. The volume of chloroform is reduced to about 2 cubic centimetres and the presence of cholesterol detected by Liebermann's test which is thus carried out. (Add to chloroform solution a few drops of acetic anhydride, then add concentrated sulphuric acid drop by drop. After a time a rose colouration of the acid, and a violet colouration of

FIG. 10.



Photomicrograph of crystals of choline periodide obtained from a small quantity of the cerebro-spinal fluid of a non-paralytic case, taken a few hours after death.

[2] Myers has estimated the potassium salts in the cerebro-spinal fluid in a number of general paralytics and non-paralytics with the following result. *General paralytics* (13 cases).—Average 0·038 per cent. KCl. (Highest, 0·054 per cent.; lowest, 0·027 per cent. KCl.) *Non-paralytics* (4 cases).—Average 0·033 per cent. KCl. (Highest, 0·039 per cent.; lowest 0·027 per cent. KCl.) These results were obtained from 10 cubic centimetres of cerebro-spinal fluid in each case, and it was deemed advisable, in repeating the work, to make determinations on appreciable quantities of fluid from two or three cases instead of on smaller quantities from each case. I have therefore examined larger quantities of cerebro-spinal fluid obtained by adding together the fluids from several cases of dementia præcox and general paralysis with the following results:—

Dementia Præcox.	*General Paralysis.*
1. 27·5 c.c. 0·033 per cent. KCl.	1. 40 c.c. 0·038 per cent. KCl.
2. 27·5 c.c. 0·038 ,, ,,	2.* 40 c.c. 0·034 ,, ,,
3. 26·0 c.c. 0·030 ,, ,,	Average 0·036 ,, ,,
Average 0·033 ,, ,,	

* All fluids used in this instance gave a positive Wassermann reaction.

the chloroform turning to blue, then green, indicate the presence of cholesterol.)

The test for sugar can be performed on one or more cubic centimetres of the original fluid, and Noguchi's and other confirmatory tests may be made on any remaining fluid. Many observations have been made based upon the examination of fluids obtained after death; I have found, however, that within a very short time after death the composition of the fluid so alters that the results obtained are useless and misleading.

Experiments show that if micro-organisms enter the subarachnoid space they rapidly multiply in the cerebro-spinal fluid and lead to a general colonisation. We may suppose that the micro-organisms invade the perivascular lymphatics and set up an inflammatory reaction therein, which if it does not localise the spread will eventually lead to the organisms getting into the subarachnoid space and by the movement of the cerebro-spinal fluid lead to a general infection of the membranes.

PATHOLOGICAL CONDITIONS.

Time will not permit me to do more than summarise the abnormal conditions of the cerebro-spinal fluid as a whole, and I will throw on the screen a table illustrating the principal features occurring in pathological conditions. In this table you will observe that I have made four groups, and I shall dwell more especially upon those points upon which my assistants at Claybury and myself have chiefly worked, therefore about which I have special knowledge.

TABLE II.—*Abnormal Conditions of the Cerebro-spinal Fluid.*

I. *Cytological examination.*—Normal fluid is practically free from cells. In pathological conditions an estimation is made of the type and number of cells.	1. *Polynuclear leucocytosis* generally indicates microbial invasion of the subarachnoid space by some organism other than the tubercle bacillus; but polynuclear cytosis may accompany lymphocytosis in a certain proportion of cases of tuberculous meningitis. 2. *Mononuclear leucocytosis.*—Whereas polynuclear leucocytosis points to an acute inflammatory affection of the meninges, mononuclear leucocytosis indicates a chronic condition. It occurs almost invariably in syphilis of the central nervous system, general paralysis, tabes dorsalis, tuberculous meningitis, and sleeping sickness. It has been found in other conditions—e.g., herpes zoster, acute poliomyelitis, mumps, lymphatic leukæmia, chloroma, and some cases of cerebral tumour. Mononuclears may also replace the polymorphs in the later stages of microbial infection.
II. *Bacteriological examination.* (*a*) Staining the centrifuged deposit. (*b*) Cultural methods. (*c*) Inoculation.	The most important organisms found are: pneumococcus, streptococcus, bacillus tuberculosis, diplococcus intracellularis causing meningitis. Various other micro-organisms, together with pneumococcus, pneumo-bacillus streptococcus, and staphylococcus may, as a result of secondary or terminal infection, invade the subarachnoid space.
III. *Protozoal examination.* (*a*) Staining the centrifuged deposit. (*b*) Examination of a hanging drop. (*c*) Inoculation.	The only protozoon met with constantly in the disease which it causes is the *Tryp. gambiense*. Only once has the *Treponema pallidum* been found.
IV. Biochemical.	The Wassermann reaction of the blood serum combined with that of the cerebro-spinal fluid.

SLEEPING SICKNESS, SYPHILIS, AND PARASYPHILIS.

The work in which I have been especially engaged has been the investigation of the pathological conditions met with in sleeping sickness, in syphilis, and in parasyphilis, pathological conditions in which there are many points of similarity. The meninges and perivascular lymphatics in all three of these diseases are characterised by a lymphocyte and plasma cell infiltration, and by a hyperplasia of the neuroglia cells indicative of a chronic inflammatory process, due in all probability in each case to toxic irritation. In all three of these diseases the cerebro-spinal fluid contains a large number of mononuclear cells—leucocytes.

I shall have occasion later to demonstrate other points in connexion with the cerebro-spinal fluid in these diseases. You will observe how similar is the appearance of the perivascular lymphatics of sleeping sickness, general paralysis, and syphilis. But the diseases in question present many pathological differences which would explain the different clinical phenomena. Let me first refer to sleeping sickness, a disease caused by the *Tryp. gambiense*. Whether this chronic irritation of the lymphatics is due to toxins produced by the invasion of the blood and lymphatic system of the body generally or to the presence of the organism in the cerebro-spinal fluid, is still a matter open to discussion, but I think from the examination of the brains of over 30 cases of this disease that there is a parallelism between the somnolence or drowsy stupor which is the characteristic feature of this disease and the degree and intensity of this perivascular lymphatic cell infiltration. I would attribute this to the interference with the circulation of the ambient fluid of the neurons, whereby they suffer from an insufficiency of oxygen. It cannot be explained by an interference with the blood circulation, for the anæmia is not intense enough; it cannot be explained either by degenerative changes in the nerve cells, such as we find in general paralysis, for in those cases, and I may say they were few, in which a secondary microbial invasion by diplococci, streptococci, or staphylococci had not taken place, the brain presented a normal appearance to the naked eye. There was no wasting, and microscopical examination did not reveal sufficient changes in the nerve cells to account for the symptoms manifested during life. Europeans who have suffered with sleeping-sickness, and a Congo native speaking English well who died under my care in Charing Cross Hospital, could be roused from their drowsy lethargy to answer questions rationally—a very different condition to that of general paralysis, where the auto-critical faculty is almost invariably affected. The drowsy lethargy of this disease I attribute then to the failure of the oxygen supply to the cells of the cortex.

We can readily understand how this could be effected, if the fluid which circulates in the perivascular lymphatics is the ambient fluid that takes oxygen from the blood to hand it over to the nerve cells; this progressive, universal, and intense inflammatory state of the perivascular lymphatics would interfere with its flow and lead to deficient oxygen supply. Moreover, there is a vicious circle established, for the more these lymphatics become obstructed by the actively growing young cells the more the oxygen that may be in the fluid will be snapped up by them and the less will be at the disposal of the nerve cells. Consequently, the oxygen supply necessary for functional activity of the nerve cells becomes progressively less and the drowsy stupor deepens proportionately.

The experiments of Verworn, upon which I have not now time to dwell, prove the importance of oxygen storage by the nerve cells and the necessity of its supply for functional activity. Moreover, the experiments of Baeyer and Winterstein point to the fact that narcotics act by an interference with the capacity of the cell to take up oxygen, whereas normal sleep is a habit on the part of the cell of storing rather than of using oxygen.

In widespread generalised syphilitic meningitis and perivascularitis a drowsy stupor is a frequent symptom, but I attribute this in a measure to the interference with the escape of fluid from the ventricles of the brain in some cases, but in others, more particularly to the widespread obliterative endarteritis affecting the small as well as the large vessels, thus producing a generalised anæmia.

In general paralysis the perivascularitis may be very intense, but never so intense as in sleeping sickness. The dementia, which is *the* characteristic of the former disease, is proportional to the atrophy and wasting of the cortical substance, a condition which is not met with in either sleeping sickness or syphilitic brain disease. It is a primary decay of the neurons with secondary and proportional vascular changes, whereas in syphilitic brain disease the wasting and degeneration of the neurons occur in foci as a result of vascular occlusion from endarteritis or the consequent thrombosis; the symptoms are obtrusive and coarse and occur in sudden spells, whereas in general paralysis, leaving aside the seizures which may occur, the disease is insidious, continuous, and progressive.

In all these diseases, as I have said before, there is a mononuclear leucocytosis of the cerebro-spinal fluid; therefore, diagnosis by cytological methods will not suffice. There is generally also a hypertension of the cerebro-spinal fluid. Now we can leave out a consideration of sleeping sickness, for no one would diagnose that without finding the *Tryp. gambiense* in the cerebro-spinal fluid, lymphatic glands, or blood. The important point is the differential diagnosis of

syphilis from parasyphilis of the nervous system. Of the importance of this one cannot be too emphatic, for whereas syphilis of the nervous system is curable or, at any rate, benefited by mercurial treatment and administration of iodides, it is doubtful whether parasyphilis is ever cured or even benefited by this treatment, and in some cases it positively does harm. And this leads me to say that I do not regard the diphtheroid organisms described by Ford-Robertson as the organism of tabes and general paralysis as in *any* way a specific organism of this disease. My assistant, Dr. J. P. Candler, made a special study of this subject, and we have never been able to find the bacillus in the cerebro-spinal fluid, and only on one occasion was it seen in the blood, although we have examined a very large number of specimens. I think, therefore, we can leave it out of account as a means of diagnosis. Now I come to a very important method of distinguishing syphilitic disease of the nervous system from parasyphilis—I refer to the Wassermann reaction.

THE WASSERMANN REACTION.

The Wassermann reaction since its introduction has had many modifications, but it is a general opinion that, although the theory upon which Wassermann based his method is wrong, yet empirically, although the method is more tedious and more difficult of application, it is nevertheless more reliable in its results; and Dr. Candler and Dr. J. Henderson Smith of the Lister Institute have relied upon this method entirely for the results which I shall place before you. The reaction is as follows. A rabbit is immunised against the blood of the ox—that is to say, several injections of washed ox corpuscles are injected into the rabbit. The serum of this animal has then the power of dissolving the red corpuscles of the ox. This is owing to the presence of two substances—the complement, which is thermolabile, and the amboceptor, which is thermostable. If this serum is heated to 56° C. for 30 minutes it will no longer dissolve washed ox corpuscles, but if some normal guinea-pig serum be added the corpuscles are dissolved. This is due to the fact that the thermolabile substance—the complement—has been added, and in conjunction with the thermostable amboceptor has caused hæmolysis.

The serum or cerebro-spinal fluid to be examined is mixed in varying dilutions with a watery or alcoholic solution of the liver of a syphilitic fœtus; a small amount of guinea-pig serum is then added, and the total volume made up to 2 cubic centimetres with saline solution. A series of tubes containing these mixed solutions is placed in the incubator at 37° C. for one hour and the sensitised ox corpuscles are added. The mixtures are again placed in the incubator for two hours at 37° C., then taken out and put on ice overnight. The next morning the amount of hæmolysis in each tube is observed. A control experiment, using normal serum or cerebro-spinal fluid, should be made at the same time. A positive reaction is obtained when the blood or cerebro-spinal fluid causes fixation of the complement of the guinea-pig serum and hæmolysis is prevented.

It has been found that extract of guinea-pig heart, of human heart, soaps, and lecithins may replace the extract of syphilitic liver in this reaction. Consequently, the idea of the antigen and antibody theory has been abandoned. Still, it is everywhere accepted that the reaction is a most reliable aid to diagnosis.

I have purposely omitted to give the details and precautions necessary for the satisfactory carrying out of this reaction as they are given fully by Henderson Smith and Candler. They have recently examined the cerebro-spinal fluid of 127 cases of various forms of insanity. Of this number, 64 were cases of general paralysis, and in 59, or 92·1 per cent., a positive result was obtained. Of these 59 cases, 21 have since died, and the clinical diagnosis of general paralysis has been confirmed by the post-mortem investigations. Fluids from 63 cases not suffering from general paralysis were also examined, and in no single instance was a positive reaction obtained. A few of these cases have since died, but none showed at necropsy any evidence of general paralysis. 17 out of the 21 cases of general paralysis above referred to, which came to the post-mortem table, showed before death an excess of lymphocytes in the cerebro-spinal fluid.

The following table shows the results obtained by Henderson Smith and Candler in general paralysis and tabes, as compared with those collected from the literature.

TABLE III.—*Comparison of Results obtained by Henderson Smith and Candler with those collected from the Literature.*

—	Cerebro-spinal fluid.	Serum.
General paralysis.		
In literature	352 cases, 309 positive; that is, 87·7 per cent.	285 cases, 247 positive; that is, 86·6 per cent.
Henderson Smith and Candler's cases ...	64 cases, 59 positive; that is, 92·1 per cent.	10 cases, 9 positive; that is, 90·0 per cent.
Tabes dorsalis.		
In literature	112 cases, 57 positive; that is, 50·8 per cent.	176 cases, 125 positive; that is, 71·0 per cent.

Plaut, who was the first to adopt the Wassermann test for the cerebro-spinal fluid, obtained as high a percentage as 90 out of 91 cases, and in every case the serum was positive. He points to the fact that the Wassermann reaction may occasionally be obtained before there is any cell increase in the fluid, although this is the exception according to our experience, yet in one of the cases the reaction was only obtained a few days before death. The diagnosis was confirmed post mortem, macroscopically and microscopically; the cerebro-spinal fluid was withdrawn two hours after death and specimens of lateral ventricle fluid and serum from this case gave strong positive reactions. In this instance, then, although the fluid eventually became positive, it was still negative until a short time before death, when the disease was far advanced. In one of the cases the fluid remained negative throughout. It is unusual to obtain a positive reaction of the cerebro-spinal fluid in syphilis of the central nervous system, although the fluid may contain a large number of lymphocytes. There does not, then, seem to be any correlation between the lymphocytosis *per se* and the presence of the body which gives the reaction. But although syphilis of the nervous system is not accompanied by the reaction in the cerebro-spinal fluid the serum, unless the patient is under active treatment, always gives the reaction. The explanation of this is somewhat difficult. Concerning the chemistry of the Wassermann reaction I have found that a fluid giving a positive reaction fails to do so after the separation of the protein fraction. Sachs concludes that the substance is a globulin and Noguchi has come to the conclusion that the substance in the fluid causing the reaction is attached to the eu-globulin, from which it cannot be separated by solvents. In repect to the manner in which this arises in the cerebro-spinal fluid several suggestions offer themselves, one being that it is a transudation from the blood. If it were so we should expect to find it in cerebral syphilis, but as a rule this is not the case. Inasmuch as I have shown that the cerebro-spinal fluid is secreted by the choroid plexus I was naturally led to make a comparative examination of this structure in general paralysis and other diseases, but although the choroid plexus in general paralysis as compared with other diseases of corresponding age showed more frequently cystic degeneration and denudation of the choroidal epithelium, still I was unable to associate so far the two facts. A positive reaction by the Wassermann method is not necessarily associated with lymphocytosis, neither is lymphocytosis even with a positive serum reaction necessarily associated with a positive reaction of the cerebro-spinal fluid. It may be said that a positive reaction of the cerebro-spinal fluid strongly points to a parasyphilitic affection. Time will not permit me to discuss certain theories which I have put forward in explanation of parasyphilis and the presence in the cerebro-spinal fluid of a body upon which the fixation of the complement depends, but I have dealt with the subject in the Morison Lectures of 1909. I will be content with giving three striking examples out of a number of the value of this reaction.

CASES SHOWING THE APPLICATION OF THE TEST.

1. My attention was called to a case in one of the London county asylums of a woman with double optic neuritis, vomiting, and headache. I had her transferred to my care at Charing Cross Hospital, and on examination Mr. E. T. Collins found five dioptres of swelling in each disc. The cerebro-spinal fluid contained an abundance of lymphocytes but the

Wassermann reaction was negative. After treatment with mercurial inunction the swelling of the discs rapidly subsided, the vomiting and headache ceased, and she was able to read small print, whereas formerly she could not read large print. She was subsequently discharged apparently cured.

2. The condition of a patient in one of the London county asylums improved so much that the medical officers were doubtful as to whether he was a general paralytic. The Wassermann test was made on the cerebro-spinal fluid with a positive result. I expressed the opinion that it was certainly a case of general paralysis and maintained that the test was not likely to be wrong. He still continued to improve and his discharge was contemplated, but the next time I visited the asylum my prediction was confirmed. He had had several seizures and within three months he died, and the examination of the brain left no doubt as to the correctness of the diagnosis.

3. A woman, aged 34 years, was admitted to Charing Cross Hospital under my care, said to be suffering from tabes. There were no signs of syphilis on the body. Her youngest child was aged 4 years. Fifteen months previously she had had a seven months stillborn child. Four months ago she suffered with numbness in the legs, of which she took little notice; then she had double vision and tingling in the feet and legs. For the past 14 days she had suffered with a girdle sensation. She now complained of lancinating pains extending from the back down both legs, unsteadiness in gait and station, a feeling of the soles as if walking on cork, and pain and cramp in the muscles of the legs. The pupils were unequal and reacted sluggishly to light and to accommodation, the knee-jerks were absent, there were patches of anæsthesia on the legs, and a belt of thoracic anæsthesia with girdle sensation. After inquiring into the history and finding that she had suffered with headache and squint, that the knee-jerks, which were absent on admission, had returned a few days later, I concluded that this woman, with a probable duration of infection of less than four years, was suffering from pseudo-tabes, the result of syphilitic meningitis, especially as she told me that she had suffered with a slight stiffness of the neck. I then obtained Kernig's sign. The cerebro-spinal fluid showed 390 lymphocytes per cubic millimetre—an enormous number for tabes dorsalis; this large number could only be accounted for by a widespread active gummatous meningitis. She was placed on mercurial inunction, and within a fortnight the lymphocytes had fallen to 70 per cubic millimetre and the fluid gave a negative Wassermann reaction. Unfortunately, the blood was not tested on this or future occasions. A fortnight later the cerebro-spinal fluid was examined and only 20 lymphocytes per cubic millimetre were found, the patient being almost well. A fortnight later there were no lymphocytes and the fluid was still negative to the reaction. The pains, anæsthesia, and unsteadiness had entirely disappeared and the patient was quite well. Over a year has elapsed and the patient is still quite well, but there is no guarantee that she may not have a recrudescence of symptoms, for my experience has taught me that if once the contagion invades the subarachnoid space producing a diffuse meningitis, symptoms of a latent affection becoming once more active may supervene at any period after.

In conclusion, I wish to acknowledge my indebtedness to my assistants, Dr. Candler and Mr. Sydney Mann, for the invaluable help they have afforded me in conducting these researches and investigations.

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The Croonian Lectures

ON

THE BEHAVIOUR OF THE LEUCOCYTES IN INFECTION AND IMMUNITY.

Delivered before the Royal College of Physicians of London on June 14th, 16th, 21st, and 23rd, 1910,

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PATHOLOGIST TO, AND LECTURER ON PATHOLOGY AT, ST. BARTHOLOMEW'S HOSPITAL.

LECTURE III.[1]

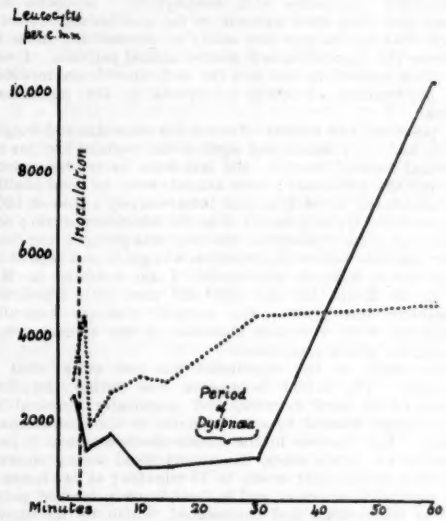
Delivered on June 21st.

MR. PRESIDENT AND GENTLEMEN,—I devoted the last part of my second lecture to a short recital of the more important facts known concerning anaphylaxis in order to justify the statements made, that the constitutional symptoms observed during initial leucopenia are actually those of anaphylactic shock, and that leucopenia is an integral part of the phenomena of anaphylaxis.

INITIAL LEUCOPENIA IN THE ANAPHYLACTIC ANIMAL AFTER INJECTION OF UNORGANISED ANTIGENS.

So far I have only described the initial leucopenia seen after the intravenous injection of living and dead bacteria. In order to complete the evidence associating this leucopenia with anaphylaxis it is necessary to show that it occurs in the case of unorganised antigens. For this purpose I have used egg-albumin and normal horse serum.

CHART 6.



Showing the curves of the circulating lymphocytes and polynuclear leucocytes after the intravenous injection of 3 cubic centimetres normal horse serum into a rabbit previously sensitised against that substance. Dotted line = lymphocytes. Continuous line = polynuclears

A normal rabbit received ¼ cubic centimetre horse serum intravenously. No symptoms of illness were produced, and leucocyte counts, made at first every few minutes, showed no initial leucopenia; indeed, the counts were almost constant for three hours. The lowest polynuclear count was 7614 per cubic millimetre at the second minute. 42 days later a second small dose of 1-250th cubic centimetre of serum was given intravenously. Another 33 days were allowed to

[1] Lectures I. and II. were published in THE LANCET of June 25th (p. 1737) and July 2nd (p. 8), 1910.

elapse, and then the animal was tested by the intravenous injection of 3 cubic centimetres of serum. The total leucocyte count fell from 5800 per cubic millimetre before inoculation to 3600 in two minutes; the polynuclears fell from 2552 to 880 per cubic millimetre in 10 minutes and remained low till the thirtieth minute, when a pronounced leucocytosis set in (14,406 polynuclears per cubic millimetre in 1½ hours.) The animal showed no marked symptoms till 20 minutes after the injection had been given; it then suddenly lay down at full length with intense dyspnœa (respirations 216 per minute). This lasted about eight minutes when, with the onset of leucocytosis, the symptoms passed off as rapidly as they had set in.

A normal rabbit was given ¼ cubic centimetre of egg-albumin (fresh white of egg diluted to 1 cubic centimetre with normal saline) intravenously. The animal remained perfectly well. No leucopenia occurred; indeed, the polynuclear count was slightly raised during the ensuing 15 minutes at each of the five observations made. 23 days afterwards the same dose was repeated: in 20 minutes the animal was lying on its side with respirations of 140 per minute, in 50 minutes it was recovering, and in 2½ hours it was apparently normal again and taking food. On this occasion the total leucocytes fell from 6600 per cubic millimetre before inoculation to 1400 at the tenth minute, and the polynuclears from 1716 per cubic millimetre before inoculation to 88 one minute after. They then rose, and in 2½ hours there was a polynuclear leucocytosis (12,402 polynuclears per cubic millimetre).

It is thus plain that an initial leucopenia similar to that seen after bacterial injections occurs also in the anaphylactic animal when a second dose of antigen is administered, even though this be an unorganised protein.

THE EFFECT OF DEEP ETHER NARCOSIS ON ANAPHYLACTIC SHOCK AND LEUCOPENIA.

I have endeavoured still further to complete the evidence associating leucopenia with anaphylaxis. Besredka has shown that deep ether narcosis so far modifies anaphylactic shock that guinea-pigs can safely be desensitised under it, whereas the unanæsthetised control animal perishes. I was therefore wishful to see how far such anæsthesia modified the phenomenon of initial leucopenia in the immunised animal.

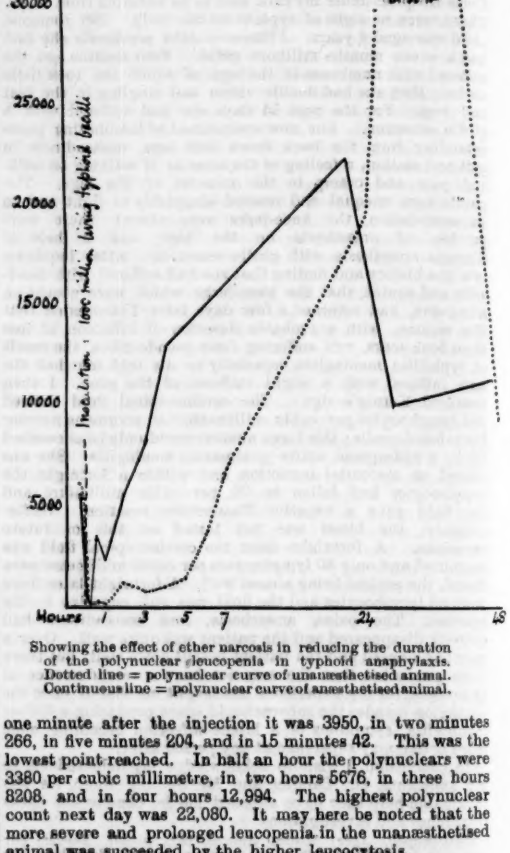
I possessed two rabbits of about the same size and weight which had been immunised against the typhoid bacillus by repeated doses of vaccine—the last doses having been given two months previously; both animals were in good health. I administered to each animal intravenously a dose of 1000 million living typhoid bacilli of an old laboratory strain; one rabbit was not anæsthetised, the other was plunged into deep ether narcosis before the injection was given and kept fully under for 15 minutes afterwards. I am indebted to Mr. H. E. G. Boyle for the skill and care with which the anæsthetic was given. He secured absolute muscular relaxation, with complete abolition of the corneal reflex during the whole experiment.

The result of the experiment was not quite what I expected. The initial leucopenia was during the first quarter of an hour extreme, and practically identical in both, though delayed by a few minutes in the anæsthetised animal. But whereas in the unanæsthetised animal it persisted for five or six hours, the anæsthetised animal showed its lowest polynuclear count at 15 minutes; at two hours it had regained the normal, and in three hours a marked polynuclear leucocytosis had commenced, which by the fourth hour had reached nearly 13,000 polynuclears per cubic millimetre. There was a corresponding difference in the symptoms exhibited by the two animals. The one to which no anæsthetic was administered was rendered markedly ill for many hours; indeed, it was two days before it completely recovered. The symptoms came on towards the end of the first hour after the injection, and were at their worst during the first half of the second hour. In the anæsthetised rabbit the symptoms were at first masked by the after-effects of the ether, but they seemed much less severe than in the control animal, and next day the animal appeared in its usual health. I could detect no noteworthy difference between the two animals as regards the rate at which the bacilli disappeared from the blood. In both they had become very scanty in a few hours.

The actual polynuclear counts were as follows. In the unanæsthetised animal these cells were 6102 per cubic millimetre before inoculation. In one minute they fell to 1312, in two minutes they were 288, in five minutes 44, in 15 minutes 14; they then rose a little and for the next hour and a half varied between 170 and 306. By the fifth hour they had risen to 2145 and in seven hours to 6786. 29 hours after the injection they numbered over 55,000; this leucocytosis was practically over on the second day after the injection.

The corresponding facts in the anæsthetised animal were these. Before the anæsthetic the polynuclear count was 11,440 per cubic millimetre; when fully under ether, but before the injection was given this had dropped to 5632. In

CHART 7.



Showing the effect of ether narcosis in reducing the duration of the polynuclear leucopenia in typhoid anaphylaxis. Dotted line = polynuclear curve of unanæsthetised animal. Continuous line = polynuclear curve of anæsthetised animal.

one minute after the injection it was 3950, in two minutes 266, in five minutes 204, and in 15 minutes 42. This was the lowest point reached. In half an hour the polynuclears were 3380 per cubic millimetre, in two hours 5676, in three hours 8208, and in four hours 12,994. The highest polynuclear count next day was 22,080. It may here be noted that the more severe and prolonged leucopenia in the unanæsthetised animal was succeeded by the higher leucocytosis.

So far as this one experiment goes it would seem that deep ether narcosis diminishes anaphylactic shock in the rabbit, as Besredka had found was the case in the guinea-pig. It scarcely affected the abruptness or intensity of the initial polynuclear leucopenia, but it greatly reduced its duration.

I now determined to test the rabbit which had not been anæsthetised in the foregoing experiment by repeating the injection as soon as the animal had recovered from the effects of the preceding one—i.e., when it might be supposed to be in a condition of "anti-anaphylaxis." On the third day, therefore, I gave it another 1000 million living typhoid bacilli. The animal, however, reacted much as it had done the first time. It was not made so ill and the respiration frequency was not quite so great; the lowest total leucocyte count noted was 2400 per cubic millimetre during the second hour (as against 1400 on the first occasion). The polynuclears were reduced to 90 per cubic millimetre at the

tenth minute, their lowest point, and there was no polynuclear leucocytosis on the following day. The animal was less ill than on the previous occasion. There was thus some evidence of lessened anaphylactic shock on the second occasion, but there was not that absence of symptoms which I had anticipated. The animal was very highly immune, and it may be that it was not wholly desensitised by the dose of bacilli three days previously or that antibody was beginning to return again.

I have thus brought forward evidence showing that the phenomenon of initial leucopenia, after intravenous injection of living or dead bacteria, is an immunity reaction, that it is commonly associated with constitutional symptoms, which may be severe, and that it is part and parcel of the condition known as anaphylactic shock. It seems reasonable to speak of this form of diminution in the number of circulating leucocytes as "*anaphylactic leucopenia*."

NATURE OF THE ANAPHYLACTIC STATE.

At first sight it might seem that the great accumulation of leucocytes in the lung—amounting to leucocytic thrombi in large numbers of the pulmonary capillaries—would serve to explain the respiratory embarrassment which is so conspicuous a feature of anaphylactic shock. It may be that this is a contributory cause of the distress in breathing; but I feel sure that there is much more behind. The pulmonary block, such as it is, is only an episode in the shock, though a very interesting one, for it constitutes a definite anatomical lesion characteristic of a condition in which no other constant lesion has been found. I do not, however, believe that if every leucocyte in the circulation were to accumulate in the lung it would be sufficient to cause death. In a man the total volume of all the circulating leucocytes is equivalent, according to my calculation, to that of a sphere a little less than one inch in diameter and proportionately less in the rabbit. Such a mass might cause death if impacted in a main pulmonary artery, but not, I think, if distributed in the vastly greater sectional area presented by the capillaries of the lung. Again, I find a lack of correspondence between the time of occurrence of the leucocytic accumulation in the lungs and the maximum intensity of the symptoms. In a well-marked case of anaphylactic leucopenia the polynuclears have usually reached their minimum in a quarter of an hour, at which time the animal is usually cheerful and unaffected. The symptoms of respiratory embarrassment in most of my anaphylactic rabbits have been especially marked during the second hour. Lastly, we have in the observed great fall in blood pressure a factor quite adequate to explain not only the respiratory trouble but the convulsions and death seen in an extreme case.

We have yet much to learn as to the nature of the anaphylactic state, but the provisional view which appears best to meet the facts is as follows. An anaphylactic animal is one which is naturally or artificially immune, having in its fluids a supply of antibody, but having eliminated the antigen which called this into existence. It must be assumed that the antibody is one which requires complement for its effective action. If now a second dose of antigen is administered in such a way as to enter the circulation in bulk, there occurs a sudden reaction between antigen and antibody in which the store of available complement is quickly exhausted. Why and how this sudden reaction should evoke such violent constitutional symptoms we do not yet know; we must be content to admit the fact. It may be that, as Besredka holds, the action is chiefly upon certain cell groups in the central nervous system. If further it be assumed that one of the functions of the polynuclear leucocytes is to furnish the supply of complement we may conceive these cells, exhausted of their supply, to repair to the pulmonary capillaries for oxygenation in order to recuperate.

I am inclined, indeed, to think that initial leucopenia is a more delicate test of the occurrence of the reaction between antigen and antibody in the circulation than the clinical symptoms of anaphylactic shock. I have never seen shock without some degree of leucopenia, but I have seen a marked leucopenia without any symptoms of constitutional disturbance. Of this I will quote a marked example. A rabbit had been twice immunised against washed sheep's corpuscles by the intravenous injection of 1 cubic centimetre of a 5 per cent. suspension, with a six weeks' interval between the doses. Thirty-four days after the second injection I gave the animal a third dose—3 cubic centimetres of a similar suspension. The polynuclear leucocytes fell in one minute from 1312 to 80 per cubic millimetre, and in 10 minutes there were none. In this differential count I found 200 lymphocytes in succession (see Chart 2). Yet the animal was not made ill; shock and dyspnœa were absent throughout. There was nevertheless evidence of disappearance of antibody from the circulation; before the third dose of corpuscles the hæmolytic *titre* of the serum (not inactivated) was 1 in 10; half an hour after the injection it was less than 1 in 5. The immunity was thus feeble at the commencement of the experiment, but practically absent at its close.

OBSERVATIONS ON IMMUNITY IN THE ANAPHYLACTIC ANIMAL.

It is at first sight somewhat of a contradiction in terms to speak of an animal as immune, when a dose of the antigen in question produces far more serious symptoms than it does in a normal animal and may even cause a fatal result. The immune condition, so far as it concerns the presence of a humoral antibody, seems to be one of greater sensitiveness and quicker response to the presence of the antigen. When we use the term immunity we understand in an ordinary way an increased power of resisting a naturally occurring infection. The method adopted in producing anaphylactic shock, and that which I have used in my work on rabbits, is a wholly unnatural one. Never under natural conditions can a large dose of alien protein gain sudden access to the blood; all the digestive and portal arrangements of the body are designed to shield the system from such an event. Hardly ever can a sudden large dose of bacteria gain access to the blood; never, unless there is a previous focus of infection; and here one of the conditions necessary for anaphylaxis (previous elimination of antigen) is absent. We must not, then, deny the right of the anaphylactic animal to be termed immune merely because we can make it ill, or kill it, by an artificial procedure which has no parallel in ordinary life.

As a matter of fact, I do not find that the constitutional illness associated with anaphylactic shock interferes in the least with the rapidity of disappearance from the circulation of the bacteria which have been injected. I have made a few observations bearing on this point, though they mostly cover only the first quarter of an hour after inoculation.

In a rabbit immunised against streptococcus fæcalis and into the ear-vein of which I had injected 1000 million of the living organism, 1-50th cubic centimetre of blood withdrawn every two minutes from the opposite ear yielded colonies too numerous to count at two and four minutes; at six minutes the cocci per cubic centimetre of blood were 33,000; at eight minutes, 13,000; and at 14 minutes only 5900. The animal was leucopenic all the time.

In the case of a rabbit similarly immunised against micrococcus citreus agilis, which showed no appreciable leucopenia when injected with 1000 million of the living coccus, the following figures were obtained: at two minutes 120,000 cocci per cubic centimetre of blood; at four minutes 26,000, dropping quite regularly to 1200 at the fourteenth minute.

The figures are very striking in the case of the two rabbits I have already mentioned as treated in this way with virulent pneumococci. One animal was immune, the other normal; both received the same dose (approximately 1000 million) of the same emulsion of cocci. For the first few minutes a confluent growth of pneumococci was obtained from 1-100th cubic centimetre of blood. The numbers progressively fell, but more rapidly in the immune than in the normal animal, till in 16 minutes the immune rabbit had only 15,000 cocci per cubic centimetre of blood, while the normal animal still had 125,000. The highly leucopenic rabbit was able to rid its blood of the cocci more than eight times faster than the normal one, in which leucopenia was almost absent.

In the case of a rabbit repeatedly immunised with diphtheria bacilli I gave 780 million living bacilli intravenously and found them almost gone from the circulation in 2 hours (one or two bacilli in 1-5th cubic centimetre of blood). In the case of typhoid immune rabbits intravenously injected with 1000 million living bacilli I found the bacilli absent from the circulation after 4 to 6 hours, though there had been pronounced leucopenia.

There is thus nothing to suggest that anaphylactic shock and its attendant leucopenia interfere in any way with such immunity as is evidenced by the rate of disappearance of the injected bacteria from the peripheral blood. The facts I have just mentioned do not necessarily mean a complete and

final disappearance, for in one case at least, that of the non-immune rabbit injected with virulent pneumococci, it is highly probable that the cocci would not have disappeared beyond a certain point and that the animal would have died from septicæmia. But in the case of the animals inoculated with diphtheria and typhoid bacilli—the only ones which were not killed after 15 minutes—recovery was complete.

I have only met with one case in which an immunised animal died from septicæmia while the normal control animal survived, and I do not know why this was the case. I had immunised a rabbit against B. coli communis by six large intravenous doses of killed bacilli, spread over five months, rising at the last dose to 400 million. The animal had, as the result, a fairly high opsonic index against B. coli (about 3), and its serum showed a bactericidal power against this organism which was ten-fold the normal. Four or five weeks after the last vaccination I subjected it, together with a normal untreated animal, to an intravenous dose of 750 million living B. coli communis recently isolated from a case of ulcerative colitis. The normal animal showed a moderate leucopenia (lowest total count 2000 leucocytes per cubic millimetre at 3 hours), but in 5 hours had a leucocytosis of 12,400 and next day of 52,000 and 60,000, the increase being entirely due to the polynuclears. This animal had eliminated all bacilli from its peripheral blood in 24 hours and it recovered. The immune animal, on the contrary, exhibited a progressive leucopenia from which it never emerged. At the end of 5 hours the total leucocytes were only 400 per cubic millimetre and it died, still leucopenic, in 23 hours, with about 1200 B. coli per cubic centimetre of heart's blood; the leucopenia at the end was lymphocytic no less than polynuclear. The count from the heart's blood immediately after death was, per cubic millimetre, lymphocytes 108, polynuclears 918, large hyaline 72, and basophils 102.

I may in this connexion call attention to some remarkable results obtained by Horder and Gordon with the meningococcus.[2] Searching for a criterion by which they could judge of the efficacy of vaccines and antisera against this organism, they found that whereas a normal rabbit commonly withstands an intravenous dose of no less than six sloped cultures, when given as a single dose, it readily succumbs to a series of doses, no larger in the aggregate, when these are intravenously administered at hourly intervals. Single cultures, given thus every hour, were found to kill after four to six doses, and they adopted this method of "serial dosage" in order to obtain a standard lethal effect. The serial doses produced a marked leucopenia, and it is not a little strange that no meningococci could be recovered from the blood in animals thus treated, even when the heart's blood was examined immediately after death, though in animals receiving a single massed dose of six cultures living cocci were recovered from the blood in diminishing numbers up to 24 hours after the injection.

The effect of previous vaccine treatment was to diminish the percentage of rabbits dying as the result of the serial inoculations. Out of 22 normal animals 72 per cent. died; out of 21 vaccinated animals 28 per cent. died. Testing the effect of a number of the anti-meningococcal sera on the market it was found that when the more potent sera were administered previously to, and concurrently with, the serial doses of the meningococcus, not only was no protection conferred, but in certain cases death ensued earlier than in the control animals which received no serum. Horder and Gordon suggest that this may be due to an abnormally rapid dissolution of the cocci in presence of the antiserum, with consequent sudden liberation of an excessive amount of endotoxin. They do not, however, bring forward any proof of such lytic action. I mention these interesting observations here because they offer some parallel to the case I have quoted in which an immune animal succumbed to a dose of B. coli from which a normal rabbit recovered.

I may add that on the three occasions on which I have had the opportunity of observing the effects of Sclavo's anti-anthrax serum in human cases of cutaneous anthrax, without excision of the pustule, a local exacerbation of the inflammatory symptoms has in each case followed the administration of the serum, associated with a disappearance of the bacilli from the local lesion. In one case cultures were made every hour or two from the lesion, and the bacilli, at first abundant, were extremely scanty in 12 hours and absent in 24 hours after the serum was given. All three cases made a perfect recovery. It is difficult in such cases to avoid the belief that the exacerbation of local symptoms is in some way associated with a liberation of toxin from the bacilli which are being destroyed.

Before quitting the subject of anaphylactic leucopenia I may remark that it is followed by a polynuclear leucocytosis. The law of negative and positive phases is here also apparent, and the height of the leucocytosis seems to bear some relation to the intensity and duration of the preceding leucopenia. It is difficult to draw the line between this leucocytosis and that which is commonly associated with the presence of active tissue infections. The one may often pass into the other, just as the leucopenia of the shock may pass into that of marrow exhaustion in a rapidly fatal blood infection.

THE LEUCOPENIA OF MARROW EXHAUSTION.

If a normal or immune rabbit is killed during the height of initial leucopenia following an intravenous injection of living or killed bacteria no noteworthy changes are found in the bone marrow. I have already stated that the number of cells bearing neutrophil granulations present per cubic millimetre of the normal rabbit's fresh bone marrow at the mid-femoral level may be anywhere between 100,000 and 200,000.

I have examined the marrows of six rabbits killed a quarter of an hour after the injection of large doses of living micro-organisms. Four of these were immune animals and three showed a marked leucopenia at the time they were killed, but neither these nor the ones which had exhibited no leucopenia showed any sign of marrow depletion. The neutrophil counts per cubic millimetre of marrow were in every case within the limits of normality, as the following table shows:—

Infecting organism.	Immunity.	Preceding leucopenia.	No. of cells bearing neutrophil granulations per c.mm. femur marrow.
Tubercle bacillus.	Immune.	Very marked.	159,000
" "	Not immune.	Slight.	185,000
Virulent pneumococcus.	Immune.	Extreme.	193,000
" "	Not immune.	Slight.	208,000
Streptococcus fæcalis.	Immune.	Moderate.	138.000
Micrococcus citreus agilis.	"	None.	134,000

The bone marrow in these cases was in other respects also quite normal to microscopic examination; the cells and their granulations were natural and well stained; there was no sign of any gelatinous or mucoid degeneration. It would seem, then, that whatever the mechanism of initial leucopenia exhaustion of the bone marrow has nothing to do with it.

There is, however, a form of leucopenia which we may reasonably attribute to marrow exhaustion—that, namely, which is associated with severe and rapidly fatal septicæmias. It is well known that in certain fulminant human infections, of which malignant small-pox is a good example, a circulatory leucocytosis is absent, or if at first present is soon replaced by a pronounced leucopenia, in which myelocytes and nucleated red corpuscles may be found in considerable number in the circulation. Muir has studied the bone marrow in such cases and found it on the whole a "depleted" marrow, with widened blood spaces and a diminished number of cells.[3] The marrow appears to have been robbed of its cells by the drain upon its resources, while no compensating hyperplasia has had time to occur. I find phenomena of this kind in rabbits dying from acute septicæmia. I have never seen them so marked in infection with staphylococcus aureus as with the pneumococcus and with B. coli communis, but I should be prepared to meet with them in any acute and rapidly fatal blood infection.

If one injects into the circulation of a normal rabbit a dose of 200 to 400 million living virulent staphylococcus aureus the animal commonly dies. It may die in the course of the second day acutely septicæmic and with little in the way of local signs of disease; or it may live for 4 to 10 days and die with pyæmic abscesses in the kidney and sometimes in the heart wall. There is a difference in the changes seen in the blood and in the bone marrow in these two cases.

[2] Local Government Board Reports, 1907-08.

[3] Transactions of the Pathological Society, vol. liii.

I have already said that the phenomenon of anaphylactic leucopenia is practically absent when staphylococci are intravenously administered to a normal rabbit. I have seen four animals die under such circumstances in 40 hours or less from the time of inoculation; no one of them had a severe leucopenia at any time, though in three of them counts lower than those found before inoculation were obtained at times, especially towards the end. As a rule I have found intermittently high leucocyte counts, not maintained and falling again to normal or below it as death approached. Myelocytes and nucleated red corpuscles may be found in the last stages. I have examined the bone marrow in three out of these four staphylococcal cases and found counts below the average but still within the limits of normality. The neutrophil counts at mid-femoral level were 112,000, 110,000, and 127,000 per cubic millimetre of fresh marrow. It would appear that the efforts at leucocytosis were beginning to exhaust the marrow but that the supply of neutrophil cells had not yet seriously failed, though insufficient time had elapsed for compensating structural changes in the marrow.

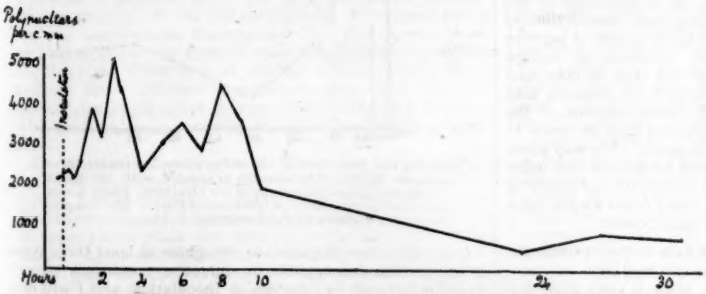
If, however, the animal survives as long as four days after the dose of staphylococci a neutrophil leucoblastic reaction begins to take place in the marrow and progressively increases. I have notes of four rabbits showing this, but I will defer mention of the facts till I come to speak of polynuclear leucocytosis. Rabbits dying four days or more after intravenous staphylococcal infection commonly show no terminal leucopenia but maintain intermittently high leucocyte counts to the end.

I have only once seen a really depleted marrow after death from acute staphylococcus aureus infection. This was in an animal greatly over-immunised against the coccus by five successive weekly doses of vaccine (200 million cocci). The animal was wasted and had a low opsonic index (0·5); it succumbed to a dose of living cocci in 11 hours without exhibiting any noteworthy leucocytosis, although a normal animal survived the dose for eight days. The bone marrow of the over-immunised animal yielded a neutrophil count of only 41,000 per cubic millimetre. I shall have directly to mention other instances in which a depleted marrow is found in the condition of wasting which not rarely attends unsuccessful efforts at immunisation. The low count of neutrophils in this rabbit's marrow was probably associated with the wasting.

Much better examples of leucopenia due to marrow exhaustion are furnished by two rabbits dying from acute septicæmia after intravenous injection of the pneumococcus and of B. coli communis respectively.

A normal rabbit, weighing 2900 grammes, received an intravenous dose of about 200 million virulent pneumococci, isolated the day before from the pericardial fluid of a fatal human case of pneumonia with pericarditis. Before the inoculation the total leucocyte count was 8800 per cubic millimetre, and of these 2156 were polynuclears. Counts were made three times during the first hour, but no initial polynuclear leucopenia was detected, though there was a heavy fall in the lymphocytes 20 minutes after inoculation. The polynuclears rose somewhat at first and at two and a half hours reached 5148 per cubic millimetre, the highest point observed. By the tenth hour they had fallen below their initial number and on the following morning they were only 480 per cubic millimetre. Septicæmia was now pronounced (250 colonies of the pneumococcus from 1·40th cubic centimetre of blood, although two hours after the inoculation this amount of blood had proved sterile). General œdema supervened and the animal died during the second night, probably about 40 hours after inoculation. The leucopenia persisted and involved lymphocytes as well as polynuclears. The latest count (31 hours) showed 3 per cent. of myelocytes, and there were a few nucleated red corpuscles. The bone marrow of this animal showed an extreme degree of depletion; the neutrophil count was difficult to carry out, as the cells were not only reduced in numbers, but seemed in large part to have lost their granulations. I could only count 24,000 cells per cubic millimetre with recognisable neutrophil granulations, and in many of these the granulations were poorly stained and scanty; there were others which showed a pinkish sub-granular protoplasm. This was so however carefully I stained the sections.

CHART 8.



Showing the polynuclear curve in a rabbit intravenously inoculated with 200,000,000 virulent pneumococci. There is no sustained attempt at leucocytosis and leucopenia soon ensues. Death occurred in about 40 hours, with no local lesions.

I have already mentioned a rabbit immunised against B. coli communis which succumbed to an intravenous dose of 750 million B. coli in 23 hours, dying with some 1200 bacilli per cubic centimetre of blood. This animal was leucopenic almost from the first. The neutrophil count from its bone marrow was 59,000 per cubic millimetre.

These two animals did not present the clinical phenomena of anaphylactic shock. Their leucopenia was progressive and endured to the end. At the time the experiments were carried out I had not begun to study initial leucopenia so fully as I did later, and I did not preserve the lungs for examination. But the strict parallel which they show with fulminant infections in man inclines me to believe that the blood changes they presented are best explained on the hypothesis of exhaustion and depletion of the bone marrow. I am disposed to regard this form of leucopenia as different in its essence from that of anaphylactic shock, though the latter may conceivably be present at the outset and pass gradually into that due to marrow exhaustion.

SPONTANEOUS MARROW-WASTING IN IMMUNITY.

It is the experience of many who have attempted to immunise animals against bacteria and against alien proteins that a certain number of the experimental animals do not prosper, but ultimately waste and die for no apparent reason, and without any cause for death being found on post-mortem examination. It has been noted, for example, in experiments on anaphylaxis that a sensitised animal may survive the immediate anaphylactic shock consequent upon a second dose, but may then pine away and die some weeks later. In my experiments on the immunisation of rabbits by the intravenous route, chiefly against bacteria, I have observed this unexplained wasting and death at least nine times. Occasionally I have felt able to attribute it to over-immunisation, but as a rule I could find no reason. I have several times observed that of two rabbits treated in the same way one has prospered and grown fat, while the other has wasted and perished. Sometimes these wasted animals develop sores on the rump or head, and in such cases I have noted polynuclear leucocytosis during life and a leucoblastic reaction of the bone marrow after death. These are, I believe, secondary to the septic sores; in animals simply wasted I have found not only no leucoblastic reaction of the marrow, but a gelatinous kind of marrow poor in cellular elements. Thus in three rabbits dying wasted while in course of immunisation with vaccines of the diphtheria bacillus, the tubercle bacillus, and Gärtner's B. enteritidis respectively, the neutrophil counts per cubic millimetre of marrow (mid-femur) were 100,000, 87,000, and 78,000.

These observations are in accord with what is known as to mucoid transformation of the bone marrow in man and other animals. It is a condition associated especially with wasting and inanition. Cadbury records it in many cases in his marrow studies in pulmonary tuberculosis.[4]

[4] Fifth Annual Report of the Henry Phipps Institute.

ANOTHER FORM OF LEUCOPENIA.

There is a form of leucopenia, well known from clinical observation in man, but with which I have not met in my observations on the rabbit. It is that seen in uncomplicated typhoid fever, and in many cases of acute general tuberculosis. It is a persistent condition, and it does not fit in with either of the forms of leucopenia which I have been describing. There is nothing to suggest that it is related either to anaphylactic shock or to marrow exhaustion. In those diseases in which it is seen there is a considerable amount of evidence that the polynuclear leucocytes play little part in the defence of the body against the infecting organism. This fact might well explain the absence of leucocytosis, but not an actual circulatory leucopenia. I do not know that the typhoid bacillus and the tubercle bacillus are distinguished by any negatively chemiotactic powers sufficient to account for the facts. Having no experimental evidence on the matter, I must be content to admit the existence of this type of leucopenia without attempting to explain it.

I now pass on to those conditions in which the circulating leucocytes are increased in number and in particular to the subject of polynuclear leucocytosis.

LEUCOCYTOSIS.

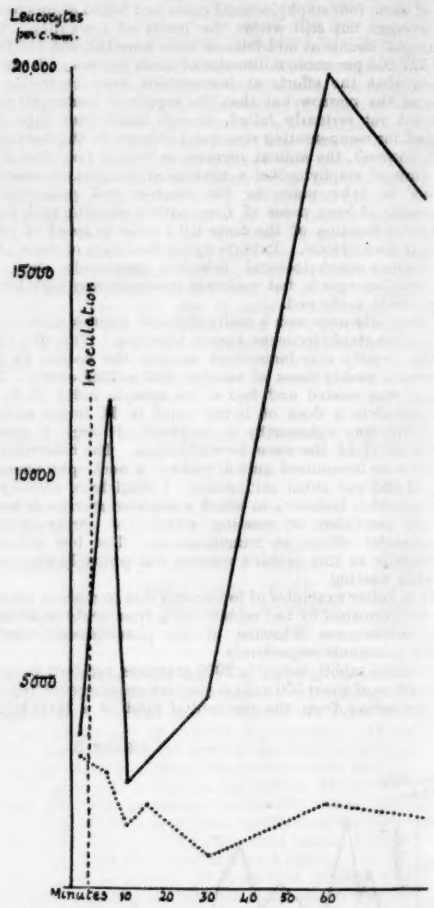
When we say that a man or an experimental animal has leucocytosis we commonly mean that the number of leucocytes in the peripheral blood is increased. With "local" leucocytosis—i.e., an accumulation of one or another kind of leucocyte in the tissues at any given point—I am not for the moment concerned. But there is another factor in the definition of the term leucocytosis. A distinction must be drawn between leucocytosis and that other, and usually more extreme and persistent, increase in the number of circulating leucocytes, presented by the group of diseases known as the "leukæmias." We know little or nothing of the causes of leukæmia, and it is therefore very difficult to draw any line between leukæmia and leucocytosis. Leukæmia is perhaps only a symptomatic condition, but it is probably fair, in the present state of our knowledge, to put the matter thus. Leucocytosis is a deliberate and purposeful increase in the circulating leucocytes: leukæmia is an apparently purposeless and wanton increase. This difference may vanish when we know more about leukæmia: at the present it holds good.

Corresponding to the purposeful nature of leucocytosis we find it almost invariably due to an increase in one special kind of leucocyte—that of which the function is in request. Here I shall deal chiefly with *polynuclear leucocytosis*—which I define as the putting out into the circulation of an abnormal number of polymorphonuclear neutrophil leucocytes, presumably to fulfil some special end. What this end may be we do not in all cases know. Often, as in invasions by the pyogenic cocci, it is clearly the phagocytic destruction of the bacteria; but we also see it after the injection of peptone and, in the immune animal, after injection of foreign proteins. Various toxic leucocytoses are seen in man, and drug leucocytoses such as that produced by cinnamic acid and its allies. We are driven to infer some function of the polynuclear leucocytes other than phagocytosis in order to explain the increased output in such cases. We may guess that where an antibody is reacting with an antigen and using up complement the functions of the leucocytes in furnishing complement are in request. But in many cases we are quite in the dark as to the meaning of the leucocytosis.

THE VARIOUS TYPES OF POLYNUCLEAR LEUCOCYTOSIS IN INFECTIONS.

I have endeavoured to show that there is more than one type of polynuclear leucopenia. My animal experiments lead me to believe that, similarly, an increase in the circulating polynuclears occurs under more than one condition of infection. When a dose of bacteria is intravenously injected into a rabbit there sometimes ensues a practically instantaneous increase in the circulating polynuclears, over in a few minutes, and followed by the ordinary initial leucopenia. In other cases I have seen a high leucocytosis coming on in an hour or two and soon followed by a progressive leucopenia. When initial leucopenia is well marked it is almost always followed by a leucocytosis lasting a few hours, or, it may be, a day, and then subsiding. When the bacteria are not promptly exterminated but gain a foothold somewhere in the body and set up local disease, there is generally seen a polynuclear leucocytosis of longer duration and often of greater intensity than in the preceding cases, lasting till death or recovery. This is the form of leucocytosis which has its parallel in human infections, and corresponds to that met with clinically. I am not prepared to say that it occurs only in local infections, but it is certainly much more characteristic of these than of septicæmic conditions, which tend to leucopenia in proportion to their gravity.

CHART 9.



Showing the behaviour of the polynuclear leucocytes in an immune rabbit intravenously inoculated with 240,000,000 living staphylococcus aureus of low virulence. There is seen an initial polynuclear rise (continuous line). The lymphocyte curve is shown by the dotted line.

I am therefore disposed to recognise at least three types of polynuclear leucocytosis in infective conditions experimentally induced by intravenous inoculation, and I will now give my reasons for this opinion in further detail.

1. EARLY OR INITIAL LEUCOCYTOSIS.

I have seen this chiefly in experiments with the pyogenic cocci, notably with staphylococcus aureus. I conceive that in the bone marrow there must exist a reserve of ripe polynuclear cells ready to pass into the blood. The sudden introduction into the body, and especially into the circulation, of a large number of bacteria possessing strongly positive chemiotactic powers for this type of leucocyte, must, I imagine, precipitate the discharge of such cells from the marrow and lead to an immediate leucocytosis which will soon be over when the reserve is exhausted. I cannot be

sure whether the phenomenon is a common one because I have not made repeated early counts in a sufficient number of cases; my impression is that this initial leucocytosis is more often absent than present.

I will quote only two instances of it. A rabbit which had been intravenously vaccinated three times with killed staphylococcus aureus was given a dose of 240 million living cocci by the same route. A control normal animal was similarly inoculated. The immune animal showed a rise from 3737 polynuclears per cubic millimetre before inoculation to 11,808 five minutes later, though the lymphocytes fell in number. Ten minutes after inoculation the polynuclears numbered only 2530 per cubic millimetre, and there was a slight leucopenia for half an hour. In the normal animal the polynuclears rose from the first. Again, in a normal rabbit inoculated intravenously with 1000 million living pneumococci the polynuclears rose in two minutes from 6596 to 8136 per cubic millimetre, falling again at the fifth minute to 3480; the lymphocytes fell during the whole five minutes.

In the absence of initial leucopenia the leucocytosis set up by the injection of the pyogenic cocci may come on in half an hour or an hour, and the same is true of harmless cocci. Thus, of two normal rabbits into the veins of which I injected living micrococcus citreus agilis (450 million), one showed 16,000 polynuclears per cubic millimetre in 30 minutes, and the other 17,000 in 1½ hours. In a normal rabbit, injected intravenously with a dose of virulent staphylococcus aureus (220 million), the blood showed an hour later a total leucocyte count of no less than 114,000 per cubic millimetre. This is an exceptionally high count, but the majority of the rabbits, normal and immune, which I have intravenously inoculated with staphylococcus aureus have had a leucocytosis by the end of the first hour. In a rapidly fatal case this may be replaced in from 12 to 24 hours by the leucopenia of marrow exhaustion. Or again, if the infection is easily overcome the leucocytosis may subside in a few hours.

2. Reactive Leucocytosis after Anaphylactic Shock.

I have observed the early leucocytosis, which I have just described, mainly in experiments with the pyogenic cocci—i.e., with bacteria having a marked positively chemiotactic power towards the polynuclear leucocytes. There is evidence that phagocytosis occurs very early in such cases, at least when the cocci are not of extreme virulence. I have mentioned the evidence which I have obtained of this in the lung of an animal inoculated with streptococcus fæcalis and killed after 16 minutes. In the reactive leucocytosis seen after non-fatal anaphylactic shock, phagocytosis cannot be invoked in explanation of the rise. Just as we see a high leucocytosis following the leucopenia consequent on injection of peptone, so, in the rabbit sensitised against a foreign protein, do we see polynuclear leucocytosis following the anaphylactic leucopenia. The phenomenon is seen in marked degree in animals immunised against the typhoid bacillus; yet there is good clinical evidence that in human typhoid fever, although suppurations may occur, the polynuclear leucocyte plays a very subordinate part compared with that which it occupies in infections by the pyogenic cocci.

So invariably have I seen a polynuclear leucocytosis to follow on the leucopenia of anaphylactic shock, whatever the foreign protein concerned—bacterial or non-bacterial—that I am disposed to regard it as an integral part of the phenomena of anaphylaxis when the shock is not attended by a fatal result. Again and again I have seen the minor symptoms of shock pass off concurrently with the onset of leucocytosis after the injection of bacterial vaccines. During the leucopenic period the rabbit refuses food, its respirations are increased in frequency, and it is difficult to obtain blood from the ear owing to lowered blood pressure. At a given moment the animal becomes cheerful, begins to eat and move about its cage; it is now found to bleed readily, and the polynuclear leucocytes are increased above the normal.

For these reasons I incline to recognise a distinct type of experimental polynuclear leucocytosis as a reactive form having no necessary connexion with the phagocytic needs of the organism, and, indeed, well seen in those cases where the disturbance is due to a foreign protein and not to an organism having any special chemiotactic influence upon the polynuclear leucocytes.

If it be asked why this leucocytosis occurs the answer is probably to be sought in the humoral functions of the polynuclear leucocytes. If it be true that these cells furnish complement, and that complement is used up in the processes associated with anaphylactic shock, the reason for their appearance in excess is sufficiently explained. In the case of the injection of bacterial vaccines phagocytosis cannot be altogether excluded as some part of the aim of reactive leucocytosis, but I doubt whether it has much to do with the matter. If phagocytosis occurs it does so early, during the leucopenic stage; the dead bacteria in the vaccine are probably easily dealt with, and their multiplication locally in the tissues is here out of court. For these reasons I incline to regard the reactive leucocytosis seen to follow the initial leucopenia consequent on intravenous administration of a vaccine as of the same nature as that seen after an alien protein, such as horse serum or egg albumin. And it may well be that, when living bacteria are substituted for the dead vaccine, the same is true when the infection is easily overcome during the first few hours.

I have seen the phenomenon of reactive polynuclear leucocytosis after the intravenous injection of horse serum, egg albumin, foreign blood corpuscles, and bacterial vaccines, especially of the coli-typhoid group, but also with diphtheria and tubercle bacilli, and it is better marked in the immune than in the normal animal. I have seen it exceedingly well marked when living typhoid bacilli are injected into the immune rabbit.

3. The Leucocytosis of Local Tissue Infection.

I am not quite clear whether I am right in calling the leucocytosis seen in established infective disease a phenomenon of *local* tissue infection. I am not prepared to deny that such polynuclear leucocytosis in human septicæmic conditions may depend upon the generalised blood infection and not upon a local lesion, but I am far from prepared to affirm it. In practically all septicæmias there exist primary, or at least secondary, foci of local infection. In those grave conditions where the blood infection is the predominant feature leucopenia is usually seen; leucocytosis seems more pronounced in proportion to the evidence of local foci of inflammation. My experiments upon the rabbit lead me to lay stress upon local infection as the main condition upon which depend the higher and more enduring forms of polynuclear leucocytosis.

It is probably safest to argue from those infections which depend upon the pyogenic cocci, since these have the most intense positively chemiotactic influence upon the leucocytes. I have repeatedly inoculated rabbits, both normal and immune, with moderate to large doses of living virulent staphylococcus aureus. Sometimes the animal dies within two days, with a pronounced septicæmia; such cases may show a high early leucocytosis, but it is one soon over and replaced, as the animal becomes more ill, by a leucopenia which persists till death, and no focal lesions can as a rule be found in these animals. The spleen may be enlarged and a few subserous hæmorrhages may be seen, but that is all. It is well known that such post-mortem appearances may be all that can be found in certain fulminant septicæmias in man. But in a rabbit dying some four to seven days after an intravenous infection with the staphylococcus the course of events is very different. There may be an initial leucocytosis or the polynuclear leucocytes may not at first be much increased in the circulation, but in two or three days a leucocytosis, essentially polynuclear, becomes established and persists, often with striking fluctuations, to the fatal issue. Such cases always exhibit local foci of suppuration, most invariably in the renal medulla, but often in the heart muscle and sometimes elsewhere. And I shall presently show that they also exhibit a very striking neutrophil leucoblastic reaction in the bone marrow, absent in the cases of earlier death.

In two animals which had been highly immunised against staphylococcus aureus, but which nevertheless succumbed to infections with the living coccus, 8 and 17 days respectively after intravenous inoculation, the local focus of suppuration was found in the spinal meninges. It is noteworthy that in several of these cases of delayed death after intravenous inoculation with staphylococcus aureus, and in which high leucocytosis had been observed to the end, the cocci could not be recovered from the blood during life or even from the heart's blood after death. The condition was not essentially a septicæmia, but a local visceral infection.

I may further mention an experiment with the pneumococcus which adds force to the preceding facts. It is well known that the rabbit is highly susceptible to this coccus, and when infected with a virulent strain succumbs to a diffuse septicæmia without local lesions. I have already mentioned such an instance in speaking of the leucopenia of marrow exhaustion. I had inoculated another normal rabbit at the same time with the same strain of pneumococcus, using the actual pericardial fluid from a fatal human case, and not a culture. Half a cubic centimetre of the fluid was injected intravenously; I cannot state the number of cocci present in this. Before inoculation the polynuclears of this animal were rather high, numbering 8480 per cubic millimetre. They fell in 20 minutes to 3268, and during the 10 hours on the day of inoculation during which leucocyte counts were made, they varied from 2656 to 7696 per cubic millimetre, never reaching the initial figure. On the following day the animal was evidently ill, and there was a marked polynuclear leucopenia (700 to 1500 per cubic millimetre). On the third day it was no better, and the polynuclears numbered only 1700 to 2100 per cubic millimetre. Nucleated red corpuscles were present in the blood, and there was still a septicæmia. 1-40th cubic centimetre of blood yielded two colonies of the pneumococcus. I had no doubt that the animal would die, but a new and almost dramatic turn was given to the case by the development of a local lesion. Starting on the third day and rapidly increasing in intensity there arose a typical erysipelas of the inoculated ear, which by and by presented bullæ of clear fluid yielding pure but not abundant colonies of the pneumococcus. (I have once before seen erysipelas occur in the rabbit after inoculation with the pneumococcus, and human cases have been recorded.) With the onset of the local lesion the blood picture entirely changed; on the fourth and fifth days the polynuclears numbered 12,000 and 13,000 per cubic millimetre, and on the sixth day nearly 20,000. They remained intermittently high for many days. The animal recovered and was later used for an experiment I have already mentioned.

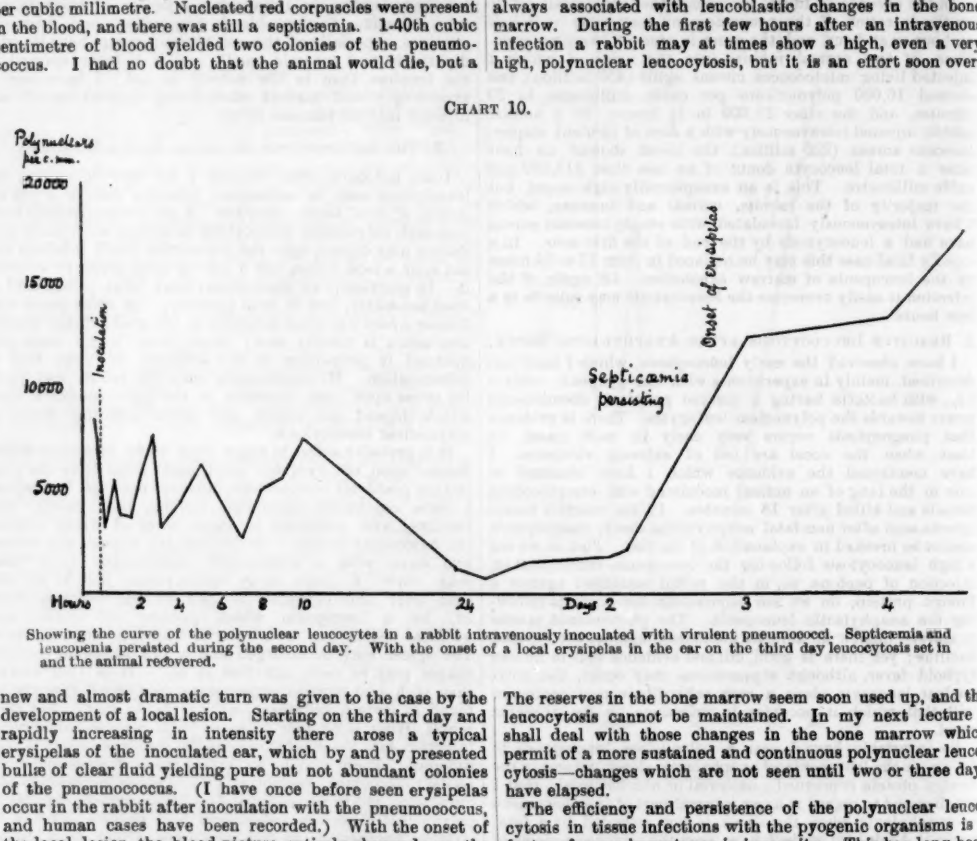
The occurrence of a pronounced polynuclear leucocytosis, with the onset of the local lesion, appeared to be the turning point in a case which had threatened to be fatal. The humoral changes in the blood were not followed, though I believe they might have proved instructive. But I think it is legitimate to use the case as an argument in favour of the view that polynuclear leucocytosis is essentially a phenomenon of local tissue infection, rather than of general blood infection. Whether this be so or not I have one or two remarks to offer as to the characters and associations of this form of polynuclear leucocytosis.

The first is that the actual number of circulating leucocytes varies from hour to hour, sometimes in very sudden fashion. It is only when counts are made at frequent intervals that this fact becomes apparent. It would seem as though under the stress of infection the polynuclear leucocytes were discharged into the circulation not continuously and uniformly but in irregular gushes, in the intervals between which fresh crops mature. Making every allowance for possible errors in technique and for the fallacies attending local leucocytosis, I feel convinced that these fluctuations are genuine. In a rabbit intravenously inoculated with the pyogenic cocci, I have seen an increase from 9000 to 72,000 leucocytes per cubic millimetre in less than an hour, and though that is perhaps an extreme case, I have seen the same sort of thing in lesser degree on many occasions. Whether similar abrupt variations in the leucocyte count occur in human beings suffering from similar infections I do not know.

The persistent, though perhaps intermittent, leucocytosis seen in tissue infections with the pyogenic cocci seems always associated with leucoblastic changes in the bone marrow. During the first few hours after an intravenous infection a rabbit may at times show a high, even a very high, polynuclear leucocytosis, but it is an effort soon over. The reserves in the bone marrow seem soon used up, and the leucocytosis cannot be maintained. In my next lecture I shall deal with those changes in the bone marrow which permit of a more sustained and continuous polynuclear leucocytosis—changes which are not seen until two or three days have elapsed.

The efficiency and persistence of the polynuclear leucocytosis in tissue infections with the pyogenic organisms is a factor of some importance in immunity. This has long been recognised from clinical observation in such human diseases as pneumonia. Absence of circulatory leucocytosis in a serious attack of this disease is of almost fatal augury. I have obtained some evidence from animal experiment that increasing immunity is attended by higher degrees of leucocytosis. Dr. Horder and I, in our report to the Local Government Board (1907–08), record an elaborate experiment on ten rabbits which supports this conclusion. The animals were treated with an intravenous dose of staphylococcus aureus vaccine (200 million) every week, and each week two animals were sacrificed, one for an examination of its bone marrow and one for a test against a normal control rabbit as to its resistance to a dangerous dose of living staphylococci. The doses proved too large and too frequently repeated for a satisfactory immunity to result. For the first two or three weeks the immunity increased

CHART 10.



Showing the curve of the polynuclear leucocytes in a rabbit intravenously inoculated with virulent pneumococci. Septicæmia and leucopenia persisted during the second day. With the onset of a local erysipelas in the ear on the third day leucocytosis set in and the animal recovered.

rapidly; the opsonic indices rose, there was a definite leucoblastic reaction of the bone marrow, and the animals tested by inoculation with living cocci survived much longer than the untreated controls. After the third week the over-immunisation was apparent, the immunity reactions diminished, and the protection faded, till, at the end, one of the last surviving animals was found abnormally susceptible to the staphylococcus.

The special point in the experiment upon which I wish to lay stress here concerns the leucocytosis observed after the successive vaccinations. It was impossible to carry out repeated counts upon so many animals, so a different plan was employed: the highest leucocyte counts after intravenous injection of staphylococcal vaccines had been commonly noted about the fifth hour. At this hour, therefore, after each weekly dose the leucocytes were counted in the gradually diminishing band of animals. Five hours after the first vaccination the average of the ten rabbits was 9780 leucocytes per cubic millimetre, after the second vaccination the average of the remaining eight was 24,775. The figures for the third, fourth, and fifth vaccinations were 22,066, 27,700, and 20,600 per cubic millimetre. It would thus appear that with increasing immunity—i.e., in this case up to the second or third week—there was an increased circulatory leucocytic response to the same dose of antigen and that this response lessened at the end as protection faded.

Had I time I could adduce one or two other observations pointing in the same direction. But I must be content to state my belief that in the case of infection with the pyogenic cocci the immune animal responds by a higher and a more ready increase in the circulating polynuclear leucocytes than the normal animal. The facts which I shall have to relate in my next lecture as regards the bone marrow support and explain this.

SUBMUCOUS RESECTION OF THE NASAL SEPTUM,

WITH A REVIEW OF 120 CASES.[1]

BY H. BELL TAWSE, M.B., CH.B. ABERD., F.R.C.S. ENG.

THE surgical treatment of deviations of the nasal septum was until recent years most unsatisfactory and extremely disappointing, and the rhinologist was frequently reproached for his inability to correct the deformity and relieve the accompanying nasal obstruction. This reproach was not due to any lack of enterprise on the part of the surgeon. Far from it. The variety of operations was manifold, their modifications endless, and the armamentarium which had accumulated in a few years would have stocked quite a good-sized museum. In spite of all their efforts rhinologists were still slighted, and their medical brethren did not hesitate to taunt them with accounts of patients who had vainly visited in turn the famous rhinological shrines of Europe in the hope of finding a speedy release from their sufferings. Many of these, in a hopelessly neurotic condition, either became resigned to their fate or drifted into the hands of the unscrupulous quack—not at all a comforting termination either for the patient or for the doctor.

Truly enough, the older methods answered very well for small spurs and slight bends, but for the worst varieties of deviations surgical treatment seemed to be at a standstill and many rhinologists hesitated to tackle them. In 1904 Killian and Freer, however, came to the rescue and introduced the now famous submucous resection—by far the most scientific operation which has ever been devised for the remedying of septal distortion. When Killian's paper was first published a few immediately condemned it, many were sceptical, and all freely criticised it.

The various steps in the operation have undergone many modifications and a few improvements have been introduced, but it has successfully withstood all objections, and at the present time its main principles remain unaltered.

Before describing the operation, perhaps you will permit me to briefly allude to the structure of the nasal septum. It is formed by the thin perpendicular plate of the ethmoid above, by the vomer below, and by the triangular cartilage in front. The latter hardly ever lies in the median line, and is often irregularly thickened. Deflections and thickenings of the septum are almost limited to its anterior three-quarters and to its lower part, the posterior quarter usually being in the median line, and the posterior choanæ of equal size. Though some septal irregularities are undoubtedly traumatic, the great majority are probably developmental. They may be found in quite young children, but most often become marked about the eleventh or twelfth year or later, when rapid development of the face and jaw is in progress. It is covered by a highly vascular mucous membrane, which is inseparably united with the periosteum and perichondrium. This, as I shall point out later, is an important point to remember in carrying out Killian's operation. Further details of the structure of the mucous membrane I need not trouble you with. I know of no operation more easy to describe than submucous resection of the septum, but there are few operations more difficult to carry out in a skilful manner. I shall not readily forget the first one I did. I am not quite sure how much longer than an hour it took me to finish it, and I had not the usual luck of a beginner to strike an easy case. The septum deviated in all directions and the perichondrium seemed as obscure as the peritoneum to the operating surgeon making his first abdominal incision. Of course, I perforated the mucous membrane more than once, and the hole I made was a large one, but I had the consolation of knowing that the patient was delighted with the result whilst I was almost heartbroken at my clumsiness, or as I would rather term it my lack of skill.

Selection of the Anæsthetic.

The first point to be decided is, "Are we to use a local anæsthetic or a general anæsthetic, or both?" Contrary to the custom of many I always use a local anæsthetic, and out of the 120 cases which I have operated on, in only one patient would a general anæsthetic have been preferable. This patient was a young lady of a highly hysterical disposition, and she constantly impeded the manipulation of the instruments and otherwise interrupted the operation. Her behaviour, which was perhaps excusable, was the cause of the perforation which resulted.

The local anæsthetic which I prefer is a mixture of equal parts of 20 per cent. cocaine hydrochlor. and 1 in 1000 adrenalin chloride. Pledgets of cotton-wool are soaked in the solution, and both sides of the nose are packed so that each surface of the septum is covered by the impregnated wool. The patient is warned to avoid swallowing any of the mixture which may trickle into the throat, and after an interval of from 30 to 40 minutes operation may be commenced. To make the anæsthesia doubly sure I used formerly before starting the operation to inject beneath the mucous membrane about 20 minims of eudrenine or codrenine, with an ordinary hypodermic syringe, at various spots on either side of the septum. I have now discontinued this injection, finding that the anæsthesia was quite sufficient without it and would last for at least three-quarters of an hour. Strange to say, I have never seen toxic symptoms arise from the use of strong solutions of cocaine in these cases.

It may be impossible from the nature of the deviation to render the parts behind the bulge sufficiently anæsthetic, and it is occasionally necessary to rub a little cocaine into these areas when access to them has been obtained. Tender spots may be encountered here and there, but will be anæsthetised in a like manner.

I have often heard it said, and I believe some text-books state, that it is dangerous to give chloroform or any general anæsthetic to a patient under the influence of cocaine. This may be so, but I have seen it done so often in nasal cases in hospital practice that I begin to doubt the truth of the statement. In fact some surgeons I have worked under had the nose packed with 10 per cent. cocaine swabs for half an hour before the general anæsthetic was administered. However, as I have never adopted general anæsthesia for these cases since I came to Nottingham, I have not met with the dangers that are said to attend the use of this combination.

The great disadvantage of general anæsthesia is, in my opinion, that the patient must be in the recumbent posture, and is unable to assist the operator in any way. You may argue that the anæsthetic may be administered in the sitting

[1] A paper read before the Nottingham Medico-Chirurgical Society and the Nottingham Branch of the British Medical Association.

position. Well, that is quite true, but the risk is so materially increased that I should hesitate to advise a patient to take it. If a general anæsthetic is decided on I should strongly recommend chloroform as the only suitable one for these cases, and it must be administered with a Junker's inhaler.

Only a slight degree of anæsthesia is required, especially if cocaine has been applied. Ether, on the other hand, is an impossible anæsthetic. By the time the patient is under the mucous membrane is so congested that it bleeds on the slightest provocation. Hæmorrhage obscures the view, illumination of the field of operation is very difficult and ofttimes impossible, and continuous mopping is necessary. When you consider that the mopping has to be done by the surgeon himself, and that his one hand is engaged holding the nasal speculum, while his other is manipulating some instrument which he must lay aside in order to mop, you will at once perceive that his work has to be done in the intervals between mopping. This markedly prolongs the operation, besides affecting its accuracy. Moreover, one is practically compelled to use a Junker's apparatus, and to keep a patient under with ether alone is a herculean task, and I venture to prophesy that you will be driven to add chloroform to attain the requisite degree of anæsthesia.

Finally, a most skilful anæsthetist is indispensable, for if the patient is frequently coming out of the anæsthetic the result is sure to be disastrous. With a local anæsthetic the patient is sitting up, and can give a great deal of valuable aid to the surgeon by altering the position of the head when requested, hæmorrhage becomes a negligible quantity, and perfect illumination of the nares is possible.

Preparation of the Patient and of the Field of Operation.

I find that patients stand the operation better if they have had a good meal just before applying the cocaine. The tendency to faint that I have noticed in some seems to have been aggravated, if not caused, by a prolonged fast. The nose is well douched with a warm alkaline lotion; the face, the upper lip, and the vestibule of the nose are thoroughly cleansed with soap and water. Although the interior of the nose, apart from sinus infection, is well known to be sterile, the same cannot be said of the vestibule, and it is well to cut the numerous hairs, at least the larger ones, that grow from its cutaneous lining. I never insist on, and seldom advise, the removal of a moustache; it is quite unnecessary, and its presence involves the patient in no additional risk. Where suppurative sinus trouble complicates the case it is wise to douche the nose a second time just before starting the operation, and the advisability of shaving the moustache might well be put before the patient. Before describing the operation I should like you to fully understand that the resection is in all cases a partial one. Only a window of the septum is removed, a strip of about a third to a quarter of an inch broad being left along the roof to support the nose.

Operation.

Let us take a simple uncomplicated case of a bow-shaped deviation of the cartilaginous septum bulging into the right nasal fossa. Standing on the patient's right side, an incision is made on the convex side of the bulge well in front of its most prominent part. For this I usually employ an ordinary tenotome. The incision reaches from just above the vestibule down to the floor of the nose, is slightly convex forwards, and extends through mucous membrane and perichondrium down to cartilage. A blunt elevator is passed into the incision and insinuated between the mucoperichondrium and cartilage, and by moving it upwards, backwards, and downwards the membrane is raised from the cartilage. With a nasal speculum in the nostril the progress of the elevator can be watched, the stripping up of the membrane being continued till a point well behind the bulge is reached. The next step in the operation, and perhaps the most difficult one, is to cut through the cartilage in the line of the original incision, so as to obtain access to the concave side of the deviation without wounding the perichondrium of that side. This proceeding will be more easily understood if I remind you that the initial cut in the mucous membrane was made on the right side of the septum. The cartilage is scratched through with a small knife till the perichondrium on the opposite side is seen, and with a little care an elevator can be slipped between the cartilage and the perichondrium of the left or opposite side of the septum. I repeat these steps with the object of plainly demonstrating that the entire operation is carried out through one incision on the right side of the septum. In my first few cases I put a finger in the opposite nostril and cut down on it, gauging the depth of the cartilaginous incision by the sensation conveyed to my finger. On one occasion the sensation was sufficiently evident to make me hurriedly withdraw my wounded digit. Then I tried an assistant's finger, but his fear and my timidity were a hopeless combination. I soon abandoned these measures and gradually gained the necessary experience, and now find that the sensation imparted from the point of the knife is ample guidance.

Separation of the mucoperichondrium of the left side can now be commenced, the movements of the elevator being inspected and controlled through a nasal speculum in the left nostril. The extent of the separation depends, as on the other side, on the amount of cartilage requiring removal. The deformed plate of cartilage has now been freed of mucoperichondrium on both sides and is quite ready for extraction. The greater part of it can be cut out with a Ballenger's swivel knife, the membranous flap being protected from injury by a speculum with long blades. Various biting and cutting forceps are employed to facilitate further removal. The mucoperichondrial flaps are now apposed, the two sides of the nose tested as to their patency, and, if satisfactory, the cut edges of the incision are united by a couple of horsehair stitches. The operation is finished. I usually insert an oily gauze plug in each nostril for 12 hours to prevent effusion of blood between the flaps and to help union.

After-treatment.

In 12 hours the plugs are removed and the nose is douched with warm alkaline lotion, and this is repeated once or twice daily for 10 days. In a few cases re-insertion of the plugs for 12 hours is necessary. Blowing of the nose I strictly prohibit for at least three weeks. As so few patients know how to blow the nose properly, and as it is impossible to make the two nasal cavities exactly equal, undue pressure is apt to be exerted on parts of the pliable septum which may become slightly deviated again. It is judicious to keep the patient in a warm room for from five to seven days, and on the first few occasions that he goes out it is well to suggest that small pieces of cotton-wool be placed in the nostrils. My reason for this is that the cold air entering a nostril which had previously been blocked sometimes sets up neuralgia, which this cotton-wool filter seems to prevent. The stitches are removed on the third day, when the wound will be found firmly healed. Some say stitching is unnecessary, and in a few cases that is so, but, as a general rule, you will find that healing is quicker if you do, and you will thus counteract the tendency I have occasionally noted of the lips of the wound to retract.

Difficult Cases.

Unfortunately but few of the cases one meets with are so simple. The bend may be S-shaped, blocking one side in front and the other side behind, and it may be deemed prudent to make the initial incision on the concave side of the bulge so as to simplify subsequent manipulation. Again, there may be prolapse of the anterior end of the septum which curls in front of the nasal orifice, the columella deriving no support whatever from it. It is uncommon, but I have seen both nostrils blocked anteriorly from a combination of the prolapsal form with an ordinary anterior C-shaped variety. In these two types of cases the incision must be made through the skin along the anterior border, and careful and skilful dissection with scalpel and dissecting forceps is essential till the muco-cutaneous junction is passed and the under-surface of the perichondrium reached. Until then false passages are remarkably easily made, and if a perforation results anteriorly it is sure to cause annoyance. Again, the most prominent part of the deviation frequently shows a patch of chronic dry rhinitis, and then one will almost certainly encounter firm adhesion of the perichondrium to the cartilage, and the separation will demand much care and delicacy of touch to prevent buttonholing the membrane.

Bony Deformity.

Up to now I have considered only simple cartilaginous deformities, but in my experience these form a very small proportion of the cases one has to deal with.

The bony septum, more especially the vomerine part of it, nearly always plays a prominent part in the

obstruction and has to be rectified. This involves a greater separation of mucoperiosteum, is more difficult on account of the uneven and ragged surface, and is more tedious from the closer attachment of the periosteum to the bone. Hæmorrhage is apt to be troublesome, and with such a limited space to work in excellent illumination is absolutely indispensable.

In dealing with large vomerine spurs I have found the following a useful adjunct. The bone is bitten away just above the spur for a distance of from a quarter to half an inch. A long flat separator is passed into the narrowed nasal fossa, and an attempt is made to fracture the spur at its base. In this I am generally successful and the spur can be seized and extracted by a blunt conchotome, gently moved from side to side to avoid tearing the mucous membrane. This may appear to some of you to be a somewhat uncertain and unscientific procedure, but I am so pleased with its results that I intend to continue it. This specimen is a typical example of a large vomerine spur, and you will readily observe that a good deal of time would have been expended in biting out this hard bony mass bit by bit. The step is devoid of danger and has never yet caused me to make a perforation. Before going further it is well to withdraw the speculum and co-apt the mucous coverings and to carefully inspect the nasal fossæ. This will decide whether it is advisable and necessary to remove any bony projection which still narrows the cavity. To test the patency required I usually pass my little finger into each nostril almost back to the posterior choana, when any obstructing excrescence will be readily detected and dealt with.

The Maxillary Crest.

There is one other part of the deformity which often constitutes a source of difficulty and which if not treated energetically may entirely nullify the operation. It is the maxillary crest which only too often exists as a prominent outgrowth along the insertion of the septum. In none of the older methods was there any attempt made to remove it. Before starting the operation one will have decided if the crest is blocking the airway, and if so, I usually make an incision half an inch long along the base of the septum, joining it to the initial incision. An L-shaped cut results and will make separation of the membrane from the crest a much easier matter. If left untouched, obstruction is almost certain to continue, and its subsequent detachment is well-nigh impossible without permanently damaging the mucous membrane. It can be chiselled away without difficulty and without pain, or one can employ the method I have recently adopted of biting it away with Woods' forceps—a powerful and very efficient instrument as you can well imagine. Hæmorrhage will be free for a few minutes, but will soon cease after the flaps have been apposed.

Errors, Difficulties, and Pitfalls.

The first mistake is to make the incision too small and too far back. If too small the movements of the separator will be impeded, the angles of the wound are torn, and approximation is difficult. If too far back the difficulties are increased a hundredfold, much of the obstruction may be left behind, and will be a source of future trouble. It is better to take out too much than too little. A few of the results that I have been dissatisfied with have been due to over-conservatism. It is preferable to make a perforation than to leave the nose obstructed.

A fruitful source of error is failing to get beneath the perichondrium. It is the easiest thing in the world to slip the instrument between the mucous membrane and the perichondrium, and sooner or later you will be struck with the ease with which you seem to be stripping up the membrane. What has really happened is that you have made a buttonhole, and your instrument is sedulously applying itself to the edges of the wound, which it enlarges at every movement. The sudden feeling of freedom which the instrument imparts to the fingers is a danger signal. It is a warning to you to retrace your steps. You have failed to undermine the perichondrium, and a fresh beginning is your only way out of the difficulty. When reflecting the membrane from the convex side it may be impossible to prevent a perforation. When this appears unavoidable cease the separation and proceed to incise the cartilage, and carry out the same stripping on the other side. By this means you have cleared the cartilage sufficiently on both sides to allow the anterior part of it to be removed. This enables one to proceed with the further separation of the convex side. In old-standing cases, where the angle of the convexity is very acute, close adhesion of the perichondrium is to be expected. Therefore you will find it much easier for the instrument to go through the mucous membrane than through the adhesion, but this can be prevented by pressing the separator closely against the cartilage and working slowly and delicately. In one of my early cases I was so bent on carrying out this advice that I pushed the instrument through the cartilage into the opposite nasal fossa.

Adhesions to the cartilage are most troublesome in cases the result of injury. In broken noses the cartilage has been split in various directions, dislocation of these is common, and you can well imagine that the adhesions will be numerous and strong. To negotiate them is a dreadful trial of patience, and to bring the operation to a successful termination requires skill and luck. The last one I did was in a lady who was hit with a cricket-ball. The nasal bones had been smashed and the cartilage split and dislocated, and a lateral displacement of the nose was a fitting termination to her misfortune. Eighteen months later the parts had firmly healed and nasal obstruction was complete. I began to do a Killian, but from the first I had difficulty in keeping beneath the mucoperichondrium. Soon I came to a standstill, the elevator was lying between two plates of cartilage. I withdrew it and made another start, and succeeded in breaking down some more adhesions till the instrument again became jammed between other two cartilaginous plates. I tried everything I knew to get on, but failed, so I turned to the other side and commenced the separation there. The same difficulty arose, and the hæmorrhage was so severe as to render inspection out of the question. I therefore cut away as much of the cartilage as had been denuded—namely, about 1¼ inches, when bone of ivory hardness was met with. Try as I could, the membrane would not separate from it; after three-quarters of an hour's work I decided to bite out the bone and mucous membrane as best I could. I had determined to secure the patency of both nostrils, and although a perforation of the size of a shilling was left I had the pleasure of knowing later on that nasal respiration was completely re-established, and that no ill-effects had resulted from its presence. A possible danger which might be mentioned occurs whilst the cartilage is being cut with Ballenger's swivel knife. The edge of the knife may slip below the edge of the speculum and the mucous membrane, now devoid of protection, is torn at the same time as the cartilage is being cut. A little care will obviate this risk. A perforation in the posterior three-quarters of the septum results in no inconvenience and the patient may be quite unaware of its existence. In the anterior quarter a perforation is sooner or later discovered and in neurotic women may become the source of discomfort. The particular form of annoyance associated with it is a peculiar whistling sound emitted on blowing the nose.

While I am on the subject of difficulties, I might mention a peculiar condition I met with. The right side of the nose was narrowed by a bulging septum and the maxillary crest was prominent. The mucous membrane was pale, ulcerated in some parts, crusted in others, and the scars of old ulcers which had healed were evident. The patient nearly always had a cold in his head and his health was undoubtedly suffering. His septum was in an advanced stage of chronic dry rhinitis. I recommended a Killian's submucous resection and the patient consented. The mucoperichondrium was found to be firmly adherent to the cartilage and separation was a matter of some considerable difficulty, and that portion of it which encased the maxillary crest seemed to merge imperceptibly into bone. However, by dint of a little patience the stripping up of the mucous membrane was accomplished on both sides, and I concluded that the worst was over, but I was wrong. The cartilage was sclerosed and very hard, instrument after instrument was tried, but small spicules of it had been removed. I ventured to remark that all the instruments were blunt, only to be informed that they had just returned from the instrument makers. However, by a process of biting and twisting I gradually extracted, bit by bit; the last piece I fractured in the method I have already described, and a perfectly straight septum was the result. The patient has had but one cold since the operation 18 months ago, and there has been no recurrence of the crusting. Profiting by what I learned from

this case, I have done a partial resection of the septum in a few stubborn cases of chronic dry rhinitis with epistaxis, with excellent results.

Complications and Sequelæ.

There is in most of the cases, within 24 hours after operation, swelling of the turbinals and septum, due partly to the reaction after the shrinkage of the tissues with cocaine and adrenalin, but chiefly to the traumatism; it disappears in a few days. In five cases I have noted a fibrinous deposit covering the turbinals and septum on both sides appearing 24 hours after operation. In one case it persisted for a week, despite daily removal. In the others its duration was from one to three days. I foolishly omitted to have the first four deposits bacteriologically examined, but the fifth culture gave a pure growth of the pneumococcus. Hæmorrhage between the flaps I have noted in two cases, but a probe passed between the flaps easily liberates it, and it does not tend to reaccumulate. Late hæmorrhage I have never seen, but an interesting case was related to me by a friend. Here the patient was strongly advised to remain in a nursing home for a fortnight, but he was so well at the end of the fourth day that the surgeon considered that when his week was up he might return home. He did so, and two days later he bled so profusely that when the surgeon arrived the patient was almost pulseless. A little gauze plugging soon stopped the bleeding and he made an uninterrupted recovery, but I think it would be prudent to occasionally reflect on the risks that one sometimes runs in allowing patients to leave the nursing home on the third or fourth day.

Collapse of the Tip of the Nose.

I have never seen this even when the anterior part of the cartilage has been dissected out. An interesting case was that of a young man who fell downstairs three weeks after operation, hitting his nose on the edge of one of the steps. He came post haste to see me, but at the junction of the nasal bones and central cartilages, where much tenderness was complained of, only swelling could be detected. A fortnight later a slight depression was visible at this point and has remained ever since. It probably would have occurred even though no operation had been done, as plenty of the cartilaginous septum had been left in the roof to support the nose if it required it. A little crusting sometimes persists ove the site of incision for a few weeks. It is of no importance

The Indications for Killian's Submucous Resection.

1. Nasal obstruction with its attendant train of evils—catarrh, &c., from a deviated septum. 2. Headache from pressure of a spur on the middle turbinate. 3. Rhinorrhœa and sneezing—occasionally hay fever and asthma from contact of a spur with the inferior turbinate. 4. Some inveterate cases of chronic dry rhinitis. 5. Unilateral atrophic rhinitis. 6. Some cases of epistaxis. 7. As a preliminary to ethmoidal curetting or removal of the middle turbinate. 8. As a preliminary measure before dealing with empyema of the frontal sinus or maxillary antrum. 9. In broken noses to restore nasal respiration. 10. To clear a passage for the passing of a Eustachian catheter in cases of chronic middle-ear catarrh. 11. Snoring. I believe Mr. Mackie has successfully treated a case in this manner. 12. Where the air ways are naturally very narrow and the septum much thicker than usual, with bulges here and there, but not necessarily deviated, about an eighth of an inch more room can be provided by the operation. Usually in such cases cauterisation of the turbinates has failed to effect any marked improvement. 13. In adhesion of the inferior turbinate to the septum apart from or due to operation. 14. For cosmetic reasons.

You are all well acquainted with prolapse of the anterior end of the septal cartilage. It is curled across the nostril, and the skin over it is streaked with red lines from the local dilatation of small blood-vessels. It is causing no trouble, but the other orifice is not quite similar. Ladies occasionally insist on its removal if it can be done painlessly. Of course, only ¼ inch to ½ inch of cartilage is removed.

In considering the advisability of operation the age of the patient is a matter of some importance. I am always unwilling to do a resection in young children unless the obstruction is interfering with health. Killian states that children younger than 12 are not fit subjects for the operation, but Freer disagrees, and says he would operate on children at any age, whilst StClair Thomson declares his unwillingness to do a resection on anyone under the age of 17. My youngest patient was 8 years of age, and her life was being rendered miserable from constant colds in the nose and chest. Removal of adenoids improved her a bit, but it was not until nasal respiration had been fully established by a submucous resection that she became reasonably healthy. One must keep in mind that the cartilaginous septum is in its developmental stage; the nose has not nearly reached its permanent shape, and it is possible that abnormal growth may take place at various parts after operation and distort the septum again. It is now two years since I operated on this little patient, and there is already evidence that the deviation is recurring. Whether it is due to a fresh outgrowth of cartilage from the edges of the window or to the result of rapid development of the face and upper jaw I am unable to say.

A question often asked is, Does the cartilage ever become replaced? Freer states that the cartilage and bone in children *seem* to be replaced but tenders no proof, and he appears to have based his conclusions on the gradually increasing firmness of the septum as age advances and on the partial re-formation of the deviation, a case of which I have just described to you. K. M. Menzel submitted a piece of the fleshy septum to histological examination 2½ months after resection of the cartilage and found no trace of re-formation of cartilage, and this is in accordance with the researches of Paget, who states that there are no instances in which a lost portion of cartilage has been restored or a wounded portion repaired with new and well-formed permanent cartilage. The septum certainly becomes very firm and resistant as years go on, but I think this is due to strong fibrous tissue which binds the two perichondrial layers together.

The duration and tediousness of the operation have been put forward as disadvantages, but as a rule only 25 minutes are required to finish it. Some take much less, whilst a few occupy 40 minutes. My experience is that patients do not mind the time taken provided they suffer no pain. Other disadvantages are too trivial to be worth mentioning.

REVIEW OF 120 CASES (*79 Males; 41 Females*).

Age.—The youngest patient I had was a girl, 8 years of age, with complete blockage of the left nostril from a deviated septum. She also had adenoids. The operation took 25 minutes, and she never winced. Other two young patients were boys of 10 and 12 respectively, with similar conditions. Amongst the others the age ranged from 15 to 55. In only 6 cases—i.e., 5 per cent. of the cases—was the deviation purely cartilaginous. The remaining 114 were both cartilaginous and bony.

Cause.—Twelve cases, i.e., 10 per cent., had a traumatic origin; the other 108 were apparently developmental, although in many of these I venture to think the traumatic element had some share in its production, time having probably obliterated its recollection from the memory of both patient and parent. In 90 cases there was marked enlargement of the maxillary crest—these constitute 75 per cent. of the total. Disease of the middle turbinate was noted in 51 patients. In 20 there was active sinus suppuration. Polypi in 25 cases necessitated ethmoidal curetting. I removed from 24 patients, mostly youths, a mass of adenoids. Unilateral atrophic rhinitis—rather a rare condition—was present in 3 individuals. In 1 case the middle turbinate was almost completely atrophied from the pressure of a large bony spur. Three were cases of typical broken noses. In 18 there was complete collapse of the alæ nasi, requiring the use of dilators after operation. Sneezing and rhinorrhœa were the main symptoms in 4, while 2 had well-marked asthmatic symptoms. Chronic dry rhinitis, with ulceration and crusting, was the reason for operation in 5 cases. Three had adhesion of basal spur to the inferior turbinate. Fifteen had middle-ear catarrh and deafness. Supra-orbital and frontal headache was complained of by no fewer than 80 per cent. of the patients.

Results.—Nine out of the 120 had perforations after operation. Five of these occurred during the first 20 I did, and one of these was brought about by a hysterical patient. Two were intentional—cases of broken nose—to restore nasal respiration. Out of the last 100 cases I have had but two perforations, and these were very difficult cases.

Nottingham.

THE EXAMINATION OF FÆCES IN MEDICAL PRACTICE.[1]

BY DR. OSCAR KRAUS.

IN the treatment of gastric and intestinal diseases it is frequently very difficult to prescribe for any given patient a diet which is adapted to the activity of his digestion and assimilation, and in which each disturbance of function in the various portions of the digestive tract is taken into account. It is not the severe cases only which present the greatest difficulties, for some of the most intractable are to be found among those which show comparatively slight signs of impaired digestion. The persistence of these symptoms, rather than their intensity, causes the patient acute suffering and defies all medicinal and other forms of treatment.

After the stomach-tube became a recognised diagnostic appliance it was for some time believed that the examination of the gastric juice would be of great service to the physician, but further experience has shown it to be quite inefficient for the requirements of practical therapeutics.

It must always be borne in mind that not only chemical but also biological, osmotic, and similar processes are involved in the activity of the stomach, and that in digestion both motor functions and innervation of the whole digestive canal must be taken into account. In no other region of the body do the various parts take on a vicarious activity so readily as in the digestive tract. That some individuals can digest their food fairly well in spite of the fact that, at the necropsy, mere fragments of the digesting gastric mucosa are found, can only be explained in this manner, and the continuation of digestion after the operative exclusion of considerable segments of the stomach or intestine is an instance of a similar kind.

Although an examination of the fæces might have been expected to cast some light on the state of the digestive functions, it is nevertheless a fact that for many years no other substances than the ova of round worms, the proglottides of tapeworms, and the skins of grapes were looked for in the stools. Practically all that was known on the subject was included in the comprehensive works of Schmidt and Strasburger, who deserve the credit of having made the examination of fæces a modern science.

On the present occasion it is proposed to deal only with the special class of analyses which enabled us in Carlsbad to determine in patients suffering from disturbances of digestion how the food is utilised, and how the defective processes can be improved on the basis of these utilisation tests. The methods used differ from those generally employed only to a slight extent, and only in as far as requirements of the daily routine rendered certain modifications necessary. Some details of the methods to be described may be open to criticism, but, as will be pointed out, these methods have shown themselves to be practical, and they have been minutely tested for several years.

It must here be remarked that among the patients who visit the spas there are some who for the most part do not feel really ill, and who, while they readily swallow all sorts of pills, have a great objection to such diagnostic methods as the use of the stomach-tube and the examination of the fæces, but the increasing education of the public must lead to an improvement in this direction.

In practice the essential requisite is to find a suitable diet for the patient, in whom physical examination and symptomatology give more or less accurate information as to the nature and localisation of the disturbance of digestion. For the reason already mentioned it may be difficult to undertake an examination of the gastric secretion, and even if it were undertaken it must be remembered that this examination could only give information with regard to that part of the digestive activity which takes place in the stomach. On this account I avoid as much as possible making an estimation of the gastric secretion, since the usual method of syphoning out the stomach once after the trial meal fails to yield sufficient information in a large number of cases, and it often happens that the type of gastric digestion can only be recognised if the syphoning is repeated every half hour during three or four hours following the trial meal. In so-called "slow gastric digestion" the secretion of acid is insufficient at first and only reaches its maximum after several hours. This maximum may even exceed the normal. Examinations of this kind may be carried out in the case of hospital patients, but are quite impossible in private practice. As will be shown presently, this examination can to a certain extent be replaced by the examination of the stools.

It is necessary to give a trial diet for the purpose of making an examination of the fæces. The object is to determine how far each single group of food components is digested. The majority of patients suffering from disturbances of the alimentary canal have already excluded certain foodstuffs from their diet before they consult the medical man at the spa. This is done either because these articles of diet have been forbidden them by their family attendants; or because local circumstances or personal inclinations have led to the preference of starchy, vegetable, or albuminoid foodstuffs; or because certain substances have been found to bring on digestive troubles.

A variety of trial meals has been suggested by different authorities, and it has been proposed to mark the beginning of the trial meals sharply by means of indicators such as carmine, carbon, and some others. I however have always found it sufficient to require the patient to include the following substances in his dietary for about 48 hours: (1) milk, undiluted or mixed with coffee; (2) eggs; (3) animal food such as fish, poultry, beef, veal, boiled or roasted; (4) farinaceous food, including bread, potatoes, and rice; (5) the various green vegetables and roots; (6) stewed fruit; and (7) butter, bacon, ham, and the fat of meat. The choice of these articles, as well as the amount taken, may be left to the patient's taste. The aim of the examination is threefold—namely, to discover how he digests the various ingredients of his *ordinary* diet, what class of foodstuffs he might add to it, and what he ought to avoid. He is given an ordinary Boas's coproscope, a sort of glass box, which he is instructed to fill to the extent of about one-half. It is, however, necessary for him first to micturate and then to use the nightstool. In the first place, a macroscopical examination is made and any peculiar colouring or decolourisation, any macroscopically detectable mucus, or any large portions of undigested foodstuffs are noted. For the present purpose the presence of entozoa and the like need not be taken into account. The shape of the stool may be characteristic and may throw light on the nature of the intestinal movements (constipation, increased peristalsis).

The first chemical examination which is undertaken deals with the secretion of bile, a portion of fæces being stirred up in a concentrated aqueous solution of perchloride of mercury. Under normal conditions, after some hours, all the portions containing hydrobilirubin take on a red colour, while those containing bilirubin take on a green colour (mercuric chloride hydrorubin and biliverdin). An indistinct reaction shows that the secretion of bile is partly or wholly inhibited.

In the next place some fæces are placed in a Schmidt's fermenting flask and set aside for observation. It is by no means necessary to put the apparatus into an incubator; the ordinary atmospheric temperature suffices, but the fermentation proceeds more slowly. A distinct evolution of gas taking place within the first 12 hours indicates that the digestion of starches has been unsatisfactory, owing to the irritation of the mucous membrane produced by the products of fermentation (early fermentation). The reaction of the fæces under these conditions is found to be distinctly and increasingly acid. This occurs especially in catarrhal affections of the small intestine, which, as is well known, is practically the only situation where carbohydrates are digested. When gas is produced only after 24 hours or even as late as the end of the second day decomposition processes are certainly at work, which means that the albuminous substances are being split up by the increased alkalinity of the fæces. In the former case there is intestinal fermentation dyspepsia and in the latter intestinal decomposition dyspepsia. The gaseous products in the former are chiefly carbonic acid and occasionally volatile fatty acids, while in the latter they are offensive gases, especially sulphuretted hydrogen.

The examination of the digestion of fat is of especial importance in practice. It is carried out as follows. Since

[1] Abstract of an address delivered before the Medico-Chirurgical Society of Glasgow.

the quantity of fat ingested has not been weighed it is of no value to estimate the absolute quantity of fat found in the stools. The examination is therefore limited to the determination of the proportion of split-up fat to total fat.

The splitting up of fats into fatty acids, soaps, and neutral fats takes place under physiological conditions in the small intestine. It is therefore necessary to determine approximately how much of the total fatty substance present in the fæces appears as neutral fat, how much as soap, and how much as fatty acid. For clinical purposes rough determinations are sufficient. All that is required is to find out how the small intestine carries out its splitting-up functions. This is best determined by the employment of the usual extraction methods. A weighed quantity (from 2 to 3 grammes) of fæces is placed in the thimble of a Soxhlet's apparatus, and this is boiled for a short time in absolute alcohol which takes up a portion of the fat. The alcohol is then added to the chloroform in the flask of the Soxhlet's apparatus and the fæces are extracted for six hours. The extract is then evaporated over a water bath and the residue is weighed. This residue, which contains all the fats, is then titrated with an alcoholic solution of caustic potash corresponding to a decinormal solution of potassium hydrate and the result indicates the amount of fatty acid plus soaps—the triglycerides being calculated as stearic acid. According to F. Müller, the number of cubic centimetres of alkali used multiplied by 0·0284 gives the amount in grammes of fatty acid and soaps. The value 284 is the molecular weight of stearic acid, the fatty acids and soaps being calculated as this. The difference between the total fats and the fatty acids plus soaps represents the neutral fats. F. Müller has shown in his experiments that with normal activity of the small intestines and mixed diet about 75 per cent. of the fats ingested are split up into soaps and fatty acids and that the more this dissociation departs from the normal the greater is the proportion of neutral fats formed.

According to von Noorden and others, the average amount of fat ingested in a mixed diet is 125 grammes daily. This quantity would correspond normally to about 20 grammes of total fat in the fæces. The greater the quantity of total fat the more defective is the fat absorption. When the quantities of total fats are small, and at the same time the quantity of neutral fat is also small, it may be assumed that both the splitting up and the absorption are satisfactory.

Of all the numerous tests for blood, only the aloin test has proved itself satisfactory to me, because it is the only one in which the presence of iron in the fæces does not affect the result of the reaction.

Microscopical examination permits the physician to determine fairly accurately the condition of the digestive activity of the stomach and small intestines. The presence of a considerable amount of connective tissue and elastic fibres indicates a defect in the acidity of the gastric juice. In such cases a certain amount of coagulable proteid substance is usually found. These are recognised in the microscope field as casein clots and milk granules. It cannot be too forcibly emphasised that the defective dissociation of connective tissue and congulable proteins definitely points to a primary gastric affection known as achylia gastrica, or Hayem's hypopepsia. On the other hand, elastic fibres are only prepared for digestion in the stomach and are actually digested in the small intestine. The appearance of these fibres in the fæces, if not associated with connective tissue and coagulated protein, must be regarded as a sign of good gastric but defective intestinal digestion. When a considerable amount of undigested muscle fibre with well-marked contours is found in the fæces the physician may infer that the small intestine digests meat badly—a condition which may be produced by the overloading of this organ with undigested connective tissue or elastic fibres. In other words, a small intestine, which under favourable circumstances can digest muscle fibres quite easily, may digest muscle fibres imperfectly if the above-mentioned undigested food elements are present.

A sufficient secretion of the pancreatic enzyme is necessary for the complete digestion of muscle fibres. The absence of this can be recognised by undigested pieces of muscular tissue in which more or less well-preserved cell nuclei are visible. This appearance is frequently coincident with a positive result of Cammidge's excellent urine test, and may be regarded as supplementary to it.

The digestion of cereal products, vegetables, and fruits has now to be considered. The cellulose-containing stroma behaves in an analogous manner to the connective tissue and elastic fibres in meat. This stroma is only broken down in an absolutely normal small intestine, free from all traces of catarrh. Imperfect digestion of bread, and especially of the coarser varieties such as brown bread, is recognised by the detection under the microscope of portions of husks, seed cuticles, and fragments of gluten cells. Badly digested vegetables and fruits are recognised microscopically in the form of spirals containing more or less chlorophyll. Large flakes, often impregnated with crystals containing oxalic and phosphoric acids, are derived from badly digested beans, peas, and the like. These form swollen and tenacious masses in the fæces and are usually recognisable on macroscopical examination.

A drop of Lugol's solution (iodine and iodide of potassium in solution) is applied to a smear of fæces on a cover-glass. If a considerable amount of blue-coloured starch granules is seen, since these granules are derived from potato, rice, tapioca, and similar amylaceous substances, the physician may assume that the patient's amylolysis is impaired. In these cases the normal alkalinity of the intestine is usually diminished down to neutral reaction. When the starch granules are unchanged and clumped together in masses it may usually be inferred that, as a result of deficient pancreatic enzyme, the proteolysis in the small intestines is also impaired. On the other hand, swollen starch granules almost always indicate a catarrhal affection of the small intestine, where the digestion of the starches chiefly takes place. The diagnosis may be confirmed by the character of the mucus. The fæces in these cases are always acid and fermentation dyspepsia is present.

It will now be convenient to consider the behaviour of the mucus. According to Nothnagel, mucus is found in the form of "cohesion" mucus in every normal stool. This mucus, however, is not macroscopically visible; our method of detecting it microscopically was suggested by Max Adler and has been found useful for the staining and differentiation of mucus in urinary sediment. A fæcal smear is stained with a 1 per cent. solution of alizarin sulphate of sodium. Normal mucus is evidenced by the appearance of small flakes and scales, stained faintly yellow. Pathological quantities of mucus, which can be detected with the naked eye, are separated from the fæces and removed by means of a platinum loop, rinsed in water to remove as much as possible of the bile pigment, and stained as before. Max Adler believes that it is possible to determine the section of the intestine from which the mucus is derived. The farther the mucus has to travel, or, in other words, the greater the distance between the situation where the mucus is formed and the anus, the more weakly is the mucus stained. Bright red, large flakes have their source in the lower part of the large intestine, whereas mucus particles from the small intestine are stained merely yellow, and the nearer the catarrhal affection is to the duodenum the paler is the colour.

Some practical applications of the inferences drawn from these analyses may now be given, and the following typical cases have been selected from the large number which have come under my care.

The first of these patients was a married woman, and the diagnosis, made before the examination of the motions, was chronic constipation with "specific intestinal colouration," without dilatation of the stomach. The internal organs were healthy. The subjective symptoms included a constant feeling of fulness, well-marked anorexia, and migraine. She had taken cascara sagrada for years. Prior to the beginning of the treatment it was necessary for her to continue taking pills in order to obtain a motion of the bowels. The stools were consequently loose and pale yellow; much undigested food was detected macroscopically and considerable quantities of mucus in fine lamellæ were floating about. There were also present a moderate amount of connective tissue, considerable quantities of coagulated proteid substances, a little muscle fibre, a fairly large quantity of total fats, many large spirals and large flakes with distinctly recognisable parenchyma of seed cuticle, a few small clumps of minute crystals, and some swollen starch granules. Slight early fermentation took place. The following deductions were drawn from these data: the presence of coagulated protein and the moderate quantity of connective

tissue pointed to an insufficient secretion of hydrochloric acid in the stomach. The small amount of muscle fibre revealed a relatively good digestion of meat in the small intestine; the amount of total fats that was found indicated a somewhat defective absorption of fats. The mucus occurring in small flakes was interpreted as being due to a superficial catarrh of the lower segments of the small intestine. The digestion of vegetables was obviously imperfect. The original diagnosis was therefore supplemented as follows: hypopepsia (stomach), fermenting dyspepsia (catarrh of the small intestine). The patient having been put on a suitable course of "waters," with massage, the next task was to determine a proper diet. Vegetables and fruits in every form, fat meat, and especially ham, on account of its connective tissue, had to be forbidden in view of the results of the analyses. The daily diet was composed as follows. Breakfast: tea or coffee with little milk, a small allowance of rusks, one egg, and butter. The possibility of absorption of the butter fat, which is readily melted, was improved by limiting the amount of starchy foods. Lunch: soup, boiled or steamed veal or beef, chicken or fish; with two tablets of acidol-pepsin to be taken during or after the meal. During the first two days no starchy food other than one rusk was allowed, but later on a small quantity of mashed potato was added. It is a matter of experience that superficial catarrhal affections of the small intestine disappear in a few days after starches are avoided. A little wine was allowed to assist the digestion of the fats. Tea: the same as breakfast. Supper: roast meat, with acidol-pepsin. Carlsbad "Sprudelsalz" was at first prescribed for the purpose of obtaining satisfactory motions, but it was afterwards found that the bowels regulated themselves. After about three weeks there was no macroscopically visible mucus in the motions, neither was there any connective tissue, but there were a few small muscle fibres, a small quantity of total fat, and numerous masses of large crystals; there was no early fermentation. For the purpose of this examination of the fæces a full mixed diet was substituted for the prescribed diet. It was thus apparent that the hypopepsia, as well as the fermenting dyspepsia, had disappeared. The patient, who had taken a considerable quantity of vegetables and fruit, was strongly advised to avoid these for a time. She was told that she could extend the rest of her diet as she pleased. She had gained weight considerably, her colour had improved as a result of the removal of the constipation, and her general condition and appetite were excellent. There was not a trace of mucus in the motions and the irritation of the small intestine had at last been got rid of.

The second patient was a married woman in whose case the diagnosis was atony of the stomach and intestine, chronic appendicitis, cholelithiasis, anorexia, and constipation. She was very much reduced in strength and in addition had been seized with acute indigestion on the journey to Carlsbad. The result of the examination of the fæces was similar to that in the first case, and it is therefore only necessary to deal with the most salient points. The fæces contained large quantities of absolutely undigested food, large quantities of muscle fibres, with well preserved cell structure (indicating defective pancreatic digestion), a considerable amount of connective tissue and elastic fibres, and very large amounts of coagulated proteid substance (indicating a defective secretion of hydrochloric acid), a little faintly tinged mucus from the lower part of the small intestine, a very large quantity of total fats (indicating a defective absorption of fat, connected with the disturbed pancreatic function), and large masses of crystals (indicating a defective digestion of vegetables and fruits); the secretion of bile was normal and the patient had not had any attacks of gall-stone colic for several months. The foregoing received full confirmation, as is shown below. The patient was at the time in a condition in which she was absolutely incapable of digesting any kind of food. The mixed trial diet naturally did not improve matters and it therefore became necessary, before beginning the course of treatment, to wash out the stomach thoroughly. An enormous quantity of mucus was found in the stomach in addition to undigested and fermenting food residue.

It may perhaps be advisable to call attention in this place to the fact that large quantities of fluid (usually from 10 to 20 quarts) are required for this form of lavage of the stomach. I use the water of the Sprudel spring for the purpose, and if the lumen of the soft stomach-tube becomes blocked I add bicarbonate of sodium and a few drops of concentrated acetic acid alternately. The acetic acid dissolves the mucus, while the liberated carbonic acid mechanically removes it.

The choice of foodstuffs was particularly difficult in the second case, as practically everything was badly digested. The first requisite was to determine what articles of diet must be forbidden at all costs. In the case under consideration these included vegetables, fruits, starches, and fats. The only thing remaining was therefore a nitrogenous diet, which had first to be rendered digestible. The high calorific value of these foodstuffs rendered it particularly inadvisable to exclude them, since the experience gained by these analyses has taught that when one class of food is excluded from the diet the digestive organs can deal with the remainder much more easily, especially if the work is artificially assisted. In the first place, the meat must be passed through the mincing machine twice, so that it being in a state of fine division offers an increased surface for the digestive fluids to act upon. The connective tissue is especially well divided.

The diet in the second case was similar to that prescribed for the first patient. Larger quantities of acidol-pepsin, however, were given, and in addition pancreon in tablet form was ordered to be taken before meals. Meat was only allowed once a day in the form described above. In the evening small quantities of sago, groats or ground rice boiled in milk were given. Pancreon was also given before the milk-puddings. The result justified the course adopted. The catarrh disappeared and the secretion of mucus was no longer to be found when the control analysis was undertaken on August 11th, 1909, while the digestion of all foodstuffs was practically normal. A rational diet had thus supplemented the Carlsbad course in this case in a most happy manner.

Carlsbad.

THE ADMINISTRATION OF THE PUBLIC HEALTH AND EDUCATION ACTS IN RELATION TO THE PREVENTION AND CURE OF DISEASES OF THE THROAT AND NOSE.

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(*From the London School of Economics.*)

(*Concluded from p. 24.*)

School Children and Throat Hospitals.

THE throat and nose taken together constitute one of the most important regions in the body of a child as well as one of the parts most liable to derangement. The results of medical inspection of schools which have so far been made public[1] show a great amount of hitherto unnoticed and unsuspected defects, more especially of nose, throat, ears, eyes, and teeth. If these are to be remedied or prevented in a satisfactory manner a vast accession of work may be anticipated.

So far as the throats and noses of children are concerned, in the vast majority of cases the question is one of nasal obstruction or of mouth breathing or of "adenoid" overgrowth. The treatment of these conditions is generally surgical, and that operative.[2] The operation referred to is that for the removal of tonsils and adenoids. Adenoid growths were first exactly described by Wilhelm Meyer of Copenhagen, 1868.[3] The name "adenoid vegetations" was

[1] Cf. Report of Dundee Social Union, 1905; Medical Examination of State School Children in Tasmania, 1906; Report on Medical Inspection of School Children in Leith, 1906; Annual Report on the Medical Inspection of School Children in Dumfermline, 1906; Report on the Physical Condition of School Children in Edinburgh, 1906; Annual Reports of the London County Council on School Inspection, &c.

[2] THE LANCET, 1901, vol. i.

[3] THE LANCET, 1904, vol. i., p. 804; Politzer, Diseases of the Ear, p. 721; Carstairs Douglas, Laws of Health, p. 153.

invented by Meyer. Before his time operation for this condition was practically unknown. Since his time the operation has, as will be shown, attained a very important place in surgery. The literature of the subject is by this time enormous in many languages. The preventive or prophylactic aspect of treatment is scarcely taken into consideration. It may be fairly expected that school inspection will supply the necessary engine for preventive medicine in this as in a great many other matters. Meanwhile it appears advisable to inquire upon what plan and to what extent this kind of throat surgery is done under existing conditions. The metropolis may be taken as an example.

In London there are at least 40 different institutions where surgical treatment of children's throats is carried out. These are: (*a*) general hospitals with or without medical schools; (*b*) children's hospitals; and (*c*) special hospitals for diseases of nose, throat, and ear. There are also a number of small dispensaries and cottage hospitals and the work of private practitioners.

It is difficult, if not quite impossible, to arrive at anything like an exact estimate of the amount of this kind of surgery (tonsil and adenoid) that is at present done. Some hospitals keep no records of it whatsoever. Others keep records but refuse access to their books. In many general hospitals these operations are done both in the casualty department and in the special department for diseases of the throat where such a department exists. A proper record may be kept in both these departments or in one only or in neither. Private practice will account for a certain number of cases, but it is extremely probable that this number is comparatively very small and rapidly diminishing. So that although it cannot, for numerous and obvious reasons, be known it is relatively unimportant. Estimates as exact as possible have been made for 25 institutions in London. Some hospital authorities were kind enough to supply the information required. Others demanded payment for the clerical work that was necessary. In most instances the work was done by personal research. In many instances the total number of cases in a given year was exactly determined. In others an average was arrived at by working out the figures for certain months, and thence deducing a statement for the whole year. The individual totals vary from 3282 down to 25 cases per annum. There is a curious discrepancy in the figures derived from the larger general hospitals. Thus one large hospital returns as high a figure as 2957, whereas another almost as large gives only 554 per annum.

The actual figures obtained in the case of the 25 institutions investigated, placed in order of magnitude, are as follows:—

1	3282	10	700	19	300
2	3200	11	660	20	210
3	2957	12	656	21	162
4	2581	13	592	22	153
5	1884	14	554	23	93
6	1300	15	550	24	85
7	1162	16	480	25	25
8	904	17	400		
9	742	18	347	Total...	23,979

We have here practically 24,000 operations per annum for tonsils and adenoids performed in 25 hospitals. The figure is sufficiently large to attract attention and to show the vast importance of this kind of surgery. It must further be remembered that up to the present it is more or less a matter of chance whether these children are brought for treatment or are left alone and neglected. The 25 hospitals mentioned include: general hospitals, 16; children's hospitals, 4; and throat hospitals, 5. The 15 hospitals for which no returns are available include: general hospitals, 12; children's hospitals, 3; and throat hospitals, 0. If it is permissible in this case to argue from the known to the unknown, there will be 38,400 per annum of these operations done in the whole of the 40 institutions. In the London list of the Medical Directory (1909) there are 6420 registered medical practitioners. If 1 in 4 of these does one of these operations in a year (which does not seem an unduly prosperous allowance) we get 1600 additional cases. This gives a round sum of 40,000 operations. This figure is certainly a crude one and of necessity crudely obtained, but as it is more likely to be below the truth than above it, it is, so far as it goes, reliable.

The majority of the patients concerned are children at or below school age. For the purposes of this estimation it is necessary to leave out of account the special children's hospitals, because in them all patients are at or below school age. Thus, taking nine institutions which are not special hospitals for children, we find a total of 4769 operations on patients from 1 to 20 years of age. The numbers at the different ages are given in the following table:—

Age	1	2	3	4	5	6	7	8	9	10
Total	62	160	349	438	484	448	370	317	263	255

Age	11	12	13	14	15	16	17	18	19	20	—
Total	281	299	286	219	142	149	81	64	56	46	4769

Age 1 to 14 = 4231 = 88·7 per cent. Age 14 to 20 = 538 = 11·2 per cent. So that nearly 90 per cent. of these patients are at or below school age. Also (within the age limits) the majority are children attending the public elementary schools. Further, most of them are on examination found to be suffering from one or more symptoms usually caused by the presence of tonsils and adenoids. This statement, put in another point of view, means that the parents bring or send their children to the hospital because of some defect or complaint which they have themselves observed. It is well worth noting that where the child is brought to the hospital on the recommendation of some school officer the parent has frequently no complaint to make as regards the health of the child. As a rule parents will only notice the more gross obvious defects arising from pathological conditions in throat, nose, or ear.[4] Even so they will not in all cases have the enterprise to seek a remedy. Still less are they capable of co-relating defects of the organs mentioned with habits of inattention, backwardness at school, and apparent defective intelligence. Considerations of this sort provide a basis for the supposition that school inspection must, at any rate for a period, produce a great increase of medical work.[5]

The operations are performed in nearly all cases under general anæsthesia. Those who perform them are most various as regards their skill and experience. General surgeons, throat specialists, house surgeons, clinical assistants, students, qualified and unqualified, male and female, take their share in the imposing total of operations for the proper performance of which a certain amount of skill is in all cases necessary. Such skill can of course only be acquired by practice, which, at any rate at first, ought to be combined with instruction and supervision on the part of some competent surgeon. These requirements are now met by many places of medical education, and it is open to any student to take advantage of the facilities so provided. It happens, however, that remarkably few are able to do so, without doubt because of the time and expense thereby added to an already ponderous medical curriculum. The legal minimum of medical studentship is at present five years, but actually the average time taken is more nearly seven years.

It may be remarked that although these operations are frequently quite simple, yet, as in other branches of surgery, cases of considerable difficulty are met with, especially in connexion with the tonsils. It follows that they ought to be the business of specialists—that is to say, of those who have found means of acquiring the necessary experience. These considerations have an obvious importance which will not be diminished in case the existing hospitals are unable or unwilling or unauthorised to carry out any increase of work produced by the medical inspection of schools. Many of the statements contained in this paragraph apply also to the anæsthetist. It is sufficient to say that a good anæsthetist is the best assistant to the surgeon in these cases, and that he is absolutely essential, not only for the safety and comfort of the child, but also for the rapid and efficient performance of the operation. In other words, another "specialist" is wanted.

There is no doubt but that a large number of parents elect

[4] Daily Telegraph, July 2nd, 1907; Mrs. Sidney Webb, p. 21 of Report on the Medical Services of the Poor-law and the Public Health Department of English Local Government.

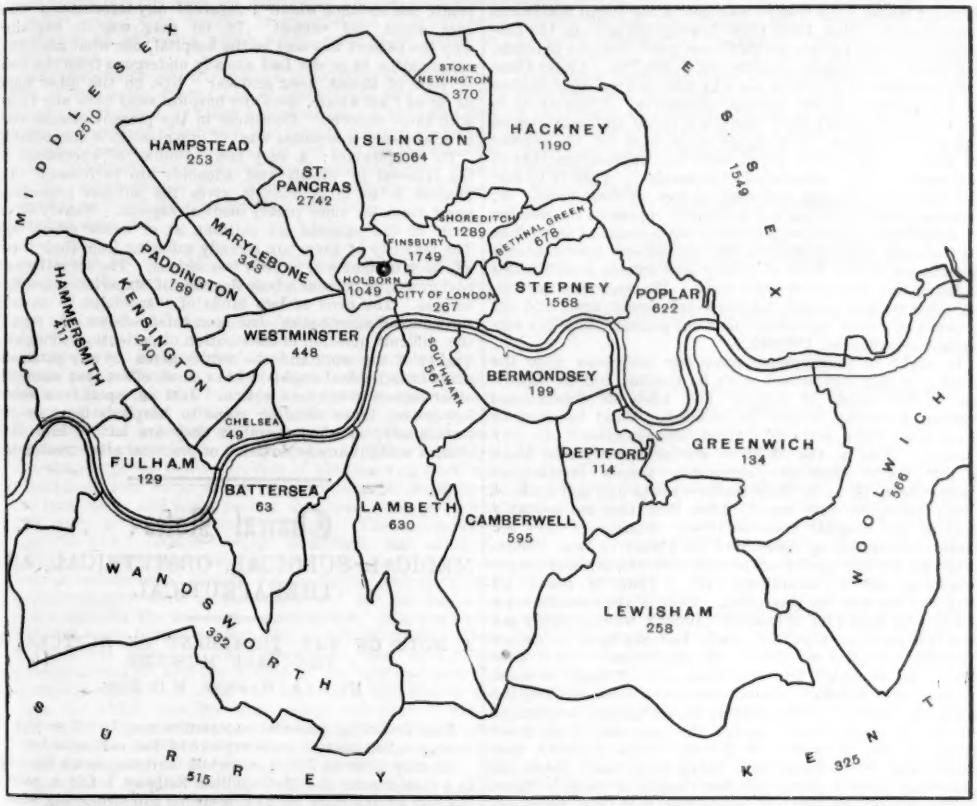
[5] THE LANCET, 1909, vol. ii., p. 420.

to take their children to that hospital which happens to be in, or nearest to, the district in which they live. But the books of practically all hospitals show innumerable instances where the people travel from remote parts of the town or even country. Particularly the special hospitals draw their clients from all parts indiscriminately. This is well shown in the annexed plan of London giving the distribution of patients attending the Hospital for Sick Children, Great Ormond-street, W.C. I am indebted for this and much other useful information to Mr. Stewart Johnson, secretary to that institution.

Numerous factors produce this peculiarity in distribution of patients. Having regard to the enormous increase during recent years in the numbers of hospital patients,[6] the said hospitals must to a certain extent have taken the place of private practitioners of all kinds—physicians, surgeons, consultants, specialists. Now, the same causes which lead fractured skull or because the hospital has the same name as her little girl? Anyone who takes the trouble to do so can often elicit the most absurd "reasons" for the selection of doctor or hospital.

To some extent the persons attending different hospitals are of different social standing. The very poor are for the most part obliged to be content with the nearest hospital, whereas the class of skilled artisans and such as earn good wages can and do pay the expenses of making long expeditions. It happens in this way that many out-patient departments are crowded with quite trivial ailments brought there at great expense of both time and money. Whatever its essential cause may be, there is a strong element of competition amongst hospitals of the present day, at any rate in London. Undoubtedly this has something to do with the distribution of the vast hordes of patients, inasmuch as it produces a large amount of advertisement of a more or less

FIG. 6.



Map showing the distribution of patients attending the Hospital for Sick Children, Great Ormond-street. The site of the hospital is marked on the north boundary of Holborn.

people to consult this or that doctor probably lead them to attend this or that hospital. Anyone who happens to read this paper may be able to decide for himself what these causes are, at any rate in his own particular case. Now in this matter there are as many minds as there are men. Also, on inquiry it is found that many of these minds are hopelessly illogical. But whether illogical or not, it is certain that the principle of "choosing your own doctor" has to be taken into account. Mrs. A takes her second child to the hospital where her first child was cured. This on the surface is a logical proceeding and Mrs. A is perfectly satisfied, although the second child may be operated upon by an inexperienced house surgeon just entered upon office a few days previously. But what of Mrs. B who brings her child to a certain hospital because her husband died there from a ordinary commercial type. It is true that this advertisement is mainly directed towards the acquisition of legacies, donations, subscriptions, &c., but another, possibly secondary, effect, if not object, is the attraction of patients. Moreover, increase of resources enables an institution to provide increased attractions in the way of fine buildings, elaborate appliances, expensive methods of treatment, and so forth. We have here one of the points where the hospital differs from the doctor, whose place it has largely taken, for to advertise is said to be contrary to medical etiquette. Hence, regarding the hospital doctor as part of the appliances of the hospital, he in this case does freely advertise—not for his own direct benefit, but for that of the prospective patient and rather his own detriment, as the patient is possibly, and often in these days probably, a person who might have paid a doctor's fee.

As has been said above, the majority of the patients with

[6] THE LANCET, 1909, vol. i., p. 5.

which this paper is concerned belong to the classes which attend the public elementary schools. These classes[7] seem to be as numerous and as various as the classes which do not attend such schools. The only element common to them all is the fact that they obtain free, or practically free, medical treatment. In these days anyone may see on the benches of hospitals numbers of people who 30 years ago would as soon have thought of going to the workhouse as to the hospital. It is said by many competent observers that the failure of the Poor-law system is to a large extent the cause of the overcrowding in hospitals, and it is of course obvious that voluntary hospitals have done and still do what is, strictly speaking, the business of the Poor-law. But a "better class" of patients also helps to fill the hospitals. It cannot be doubted that a slow but radical change is occurring in the view taken of medical assistance by large numbers of the general public. Otherwise how is anyone to account for the enormous numbers of out-patients and out-patient attendances in the London district? I quote from the Howard Medal Prize Essay[8] read before the Royal Statistical Society on Jan. 19th, 1909, the following figures:—In 123 hospitals in Greater London for 1906 there were: new out-patients, 1,871,495; out-patient attendances, 5,200,705. Under these circumstances it is hard to see why there is not a rapid decline in the number of the medical profession. Probably it is because neither the public[9] nor the medical profession realise the state of affairs. The figure given here for the number of new out-patients is given with the explanation that it includes a certain number of "renewals." That is to say, one individual may be reckoned as two or more cases. If, however, the figure does not accurately represent the number of individuals, it is a good index of the amount of work done by hospitals. The figure for the out-patient attendances is not subject to this kind of fallacy and affords a still better index of the amount of work done. We find that the contribution of five special hospitals for throat, nose, and ear to these enormous figures is: new out-patients, 28,643; out-patient attendances, 138,441.

It might be invidious to make any criticisms upon the quality of this out-patient work in London, but as regards the 40,000 cases of tonsils and adenoids (operations) further discussion cannot be avoided. What becomes of them after the operation? What after-treatment do they receive? Most of the children are necessarily sent home a few hours after the operation, simple instructions having been given to their mothers about diet and mode of living during the next week. After that they are probably seen at the hospital once or twice. Sometimes they are given "strengthening medicine" for a week or two. Sometimes the parents receive advice and instruction about proper breathing habits, cleanliness, &c. That is about all that can be said on this point. That is the most that can possibly be hoped for at present. Indeed, we may safely say that it is far more than the public has any right to expect from the voluntary services of any profession. Yet it does not go far enough. The after-treatment of many of these cases is very important, sometimes more important than the operation itself.[10] It is unlikely that even the instructions alluded to above, simple though they are, are in all cases given to the parents. It is still more unlikely that those who do receive such instructions carry them out either regularly or for a sufficient length of time. There is no supervision and no guarantee that the improved physical condition provided by these thousands of operations is taken advantage of. Too much reliance is placed on the actual operation which is too often regarded as a conjuring trick capable of dissipating instantaneously many years' growth of disease and of faulty habits. For example, children who have for any length of time lost the proper way of respiration do not easily re-learn it. Under these circumstances we shall be justified in doubting whether the benefits resulting are at all commensurate with the amount of work and disturbance involved in so much operation, so long as such a hiatus exists in the after-treatment. In a limited number of cases the beneficial effect of the operation is immediate, striking, and permanent,[11] but in the majority it is hardly given a fair chance to justify itself.

[7] THE LANCET, 1909, vol. ii., p. 729.
[8] By Percy Braun, B.Sc.
[9] THE LANCET, vol. i., 1909, p. 1417.
[10] THE LANCET, 1909, vol. i., p. 1821.
[11] THE LANCET, 1901, vol. ii., p. 24.

The effect of the Education Act of 1907 is beginning to be felt in a variety of ways. In some hospitals the number of children attending throat and other departments has increased suddenly and rapidly so as to put further strain on the available staff. The British Medical Association has taken up the subject very vigorously and issued various manifestoes. Here and there general practitioners have complained of interference with their private practice. Generally speaking, an increasing number of children present themselves at the hospitals, not making any complaint of illness themselves but because they have been "inspected" and "advised." Some of these bring a note from a nurse or school teacher. Others bring a counterfoil torn out of a record book and perhaps signed by the medical officer. Others have no document of any kind, but say they have been advised "to see a specialist." Others again only give out under cross-examination that they are the products of school inspection. I have seen a considerable number of children on these somewhat crooked lines in a hospital and I cannot recall one instance where I received any information whatever about the patient. In no case was it explained why the patient was sent to the hospital, nor what amount of examination he or she had already undergone from the point of view of throat, nose, and ear. Nor, on the other hand, so far as I am aware, does any hospital send back any record with these children. Doubtless in the present chaotic state of affairs such a hopeless want of organisation is unavoidable.

To recapitulate: A very large number of operations for the removal of tonsils and adenoids are performed. The number is so large that it gives the subject importance apart from its more purely medical aspects. Nearly 90 per cent. of the patients are children at or below school age. The majority of them are already suffering from their throat affection in some way more or less serious. The operations are performed by persons whose degrees of experience are most various. The need of two kinds of "specialist"—namely, surgeon and anæsthetist—has been briefly shown. As regards the difficult question of distribution of patients, although the quality of the work and the results given by any particular place or individual ought to have most effect, yet numerous other factors come into action. Just as, apart from school inspection, these children come to hospitals more or less fortuitously, so after operation they are left to take their chance without any supervision or practical after-treatment.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A NOTE ON THE TREATMENT OF RUPTURE OF THE CALF MUSCLES.

BY L. A. HAWKES, M.D. EDIN.

THE following personal experience may be of service to anyone called upon to treat rupture of the calf muscles.

On May 20th, at 7.30 A.M., while hurrying down the steps to a platform on the Metropolitan Railway, I felt a pain in the calf of the right leg as if someone had struck me with a stone. As I had neither stick nor umbrella locomotion was difficult and the pain unpleasant. When I reached my destination in the Edgware-road a cold compress and bandage were applied. Owing to the impossibility of obtaining a cab after the Royal funeral procession I limped to the Great Central tube station and arrived home about 1.30. The leg was further examined. There was no ecchymosis but considerable swelling and much pain all over if any attempt was made to flex the ankle. About seven hours after the accident I applied a thick layer of very hot antiphlogistine covered with cotton wool and supported by a bandage from the ankle to the knee. The leg was kept rested as much as possible until 9 P.M., when the dressing was removed and very gentle massage given for half an hour, and then redressed with antiphlogistine. The massage was at first very painful, but towards the end of the time very soothing.

This treatment of antiphlogistine twice a day and massage once was continued for six days, at which time, as the effusion had almost disappeared, the former was discontinued.

Massage was kept up for a fortnight; the treatment increased in strength while passive movements at the ankle-joint were added. No ecchymosis appeared for three days; the first signs were at the junction of the muscle and tendon of the gastrocnemius; later there was an intense livid discolouration on the inner side from the back of the knee to the sole of the foot, and in patches on the outer side; these practically disappeared in 14 days. The leg has been, and is still, kept supported by a bandage.

For the first ten days walking was painful and it was impossible to advance the left leg, and any thrust or extra weight was extremely uncomfortable. The injury appears to have been to the muscle on the inner side, for the internal saphenous nerve down to the ankle became acutely tender to pressure; this has now disappeared. I have not been absolutely laid up the whole time, though it has been necessary to curtail outside work as much as possible.

My professional friends considered that I was—well, very unwise, not to lie up, with a back splint or a plaster-of-Paris case on my leg, but with the amount of effusion that there was rest would have resulted in organisation of lymph and formation of adhesions which would have taken weeks to break down.

Antiphlogistine properly applied in reducing the inflammation of traumatic effusions is of great value and not sufficiently appreciated by many practitioners. I am quite sure that the period of absorption was greatly reduced by its use. The massage must also be given by one who has the requisite skill; practically every evening small adhesions were found in the subcutaneous and intercellular tissue, and these required care and patience for their removal.

Amwell-street, E.C.

A CASE OF ACUTE POISONING BY ANTIPYRIN.

BY G. D. H. WALLACE, M.R.C.S. ENG., L.R.C.P. LOND., D.P.H. CAMB.,
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A HEALTHY looking girl, aged 20 years, was brought to see me on April 2nd. She had been suffering from toothache and on the advice of a friend had sent to a druggist for ten grains of antipyrin. Within 15 minutes of taking it she complained of a feeling of faintness and suffocation, and her face became "blotchy" and swollen. When I saw her she was perspiring freely, the skin of the face and neck was œdematous, and there was a profuse urticarial eruption on the face, neck, and upper part of the chest. The pulse was 120, very soft, feeble, and irregular. The temperature was 95·5° F. Whilst being examined she suddenly collapsed, her face became very cyanosed, and she lost consciousness. Brandy by the mouth and strychnine hypodermically were administered and in the course of a few minutes she regained consciousness. She was put to bed, hot water bottles applied, and a calomel powder given. Three hours later the temperature had risen to 97°, the pulse-rate was 90, and the œdema of the face and neck had markedly diminished. She was kept on a milk diet for two days, by which time the temperature had risen to normal and the swelling and urticaria had completely disappeared. There was no diarrhœa or vomiting throughout, and the case differed materially from cases of ptomaine poisoning. Its most marked features were the rapid onset and recovery, the low temperature, and the great prostration. The patient had never had a previous attack (she had never taken antipyrin before), and a careful inquiry failed to elicit a history of anything eaten which might have caused the symptoms.

Birmingham.

A CASE OF EXTRA-UTERINE PREGNANCY OCCURRING TWICE IN THE SAME PERSON.

BY GEORGE A. GORDON, M.D. EDIN.

IT must be an exceedingly uncommon thing for a woman to be the victim of an extra-uterine gestation on two distinct occasions, and it is this fact which makes me put on record the following case which came recently under my care. Beyond its rarity the case presents no points of exceptional interest.

The patient was married in August, 1904, and continued to menstruate more or less regularly until July, 1906. She then missed one period and shortly afterwards began to suffer some abdominal pain, which she imagined was a "bilious attack." She consulted Mr. T. W. Goldney of Richmond, who found considerable tenderness in the hypogastrium with distension of the abdomen; also the presence of a bloody discharge from the vagina. On vaginal examination he diagnosed the case as one of ruptured tubal gestation. The patient was removed to the Royal Hospital, Richmond, where Mr. H. R. Wadd, who operated, found the left tube ruptured and the pelvis full of blood. The tube was afterwards found to contain a fœtus of about seven weeks. The patient after a somewhat critical convalescence made a good recovery.

In June, 1909, almost three years after the operation, the same woman came under my care complaining of pain in the lower part of the abdomen and some blood-stained discharge from the vagina. She stated that since the operation she had menstruated regularly but had just missed one period. On examination I found great tenderness in the region of the right tube and some abdominal distension. Per vaginam, the uterus was found to be enlarged, and in the region of the right tube a swelling of about the size of a pigeon's egg was distinctly palpable. Suspecting the case to be one of extra-uterine pregnancy, I had the patient removed at once to the hospital. Dr. S. S. Burn, who operated, found that there had been some oozing of blood from the right tube, but that this had not ruptured. On its removal it was found to contain a fœtus of about six weeks. The patient made an uninterrupted recovery and is now in good health, her one fear being that she should become pregnant a third time.

Richmond, S.W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

MEDICAL SECTION.

An Auscultatory Sphygmometer.—Dorsal Percussion of the Thorax and Stomach.

A MEETING of this section was held on June 28th, Dr. J. MITCHELL BRUCE being in the chair.

Dr. GEORGE OLIVER read a paper on a Combination of Tactile and Auscultatory Methods of Reading the Systolic and Diastolic Blood Pressure. This procedure is accurate in determining the exact point of maximum systolic pressure and diastolic pressure in an artery. The method employed is to apply an ordinary Riva Rocci band to the arm and as the pressure is increased the observer listens to the artery below the band. At a certain pressure a "thud" becomes audible and persists till it disappears, when the maximum systolic pressure is reached. The middle of the period during which the "thud" is audible represents the diastolic pressure. A specially arranged phonendoscope is attached by a bracelet to the front of the elbow below the band, which enables one examiner to make a complete observation.

Dr. WILLIAM EWART read a paper on Dorsal Percussion of the Thorax and of the Stomach, in which he reviewed the present knowledge of the systematic dorsal percussion and plexigraphy of the viscera. This had hitherto remained incomplete owing to the omission of the stomach. He filled that gap by introducing a method of "post-gastric percussion," and described a clinical sign in the back, hitherto unpublished, called "the dorsal gastric nucleus of resonance." The dorsal gastric nucleus of resonance was normally circular, under three inches in diameter, hyper-resonant, and situated below the inferior scapular angle, and therefore above the diaphragm. With Piorry's nucleus of dulness its apparent analogy is much less than its contrasts. But in the field of diagnosis its behaviour resembled that of the latter. Its lateral enlargements corresponded with those of the underlying organ itself. There was, therefore, the same tendency to an ultimate belt-like fusion at the axillary base of the dorsal percussion outline with the anterior. As regards the wider subject of the dorsal percussion of the stomach, an early study of which was contained in a paper by Dr. Ewart on the dilatations of the stomach upwards and backwards,[1]

[1] Transactions of the Clinical Society of London, vol. xxxiii., 1896.

he again laid stress upon the neglected value of a dorsal percussion and upon the major importance of the dorsal variety of upward dilatation, which commonly remained unsuspected in spite of the gravity of its symptoms. Dr. Ewart, in concluding, said that visceral plexigraphy, as hitherto restricted to the præcordium and epigastrium, was still in need of greater accuracy and completeness. It should be extended to the back and utilised in any situation, and whenever it might serve a useful purpose. The range of "dorsal" plexigraphy was in reality the larger range for normal organography, particularly in connexion with the abdominal organs. Its list of normal findings included the heart and its left auricle, the liver, the spleen, an indication of the mediastinal structures, the kidneys, and an indication of the mesenteric structures, not to mention the pelvic district. For clinical purposes, too, considerably more pathology was revealed by percussion in the back than in front. "Vertebral" percussion possessed a field and a method exclusively its own. Besides its medical aspects, "vertebral" percussion was specially available for the early surgical diagnosis of spinal affections. New fields for diagnosis by the surgeon and by the physician alike were opened up by "dorsal" percussion in three most important regions inaccessible from the front—namely, the posterior mediastinum with its glandular, inflammatory, aneurysmal, tracheal, œsophageal, and other affections; the no less vital and no less remote "mesenteric" region in connexion with the varied affections of the central abdominal organs; and the "iliac" region, which was of special importance in these days of epidemic appendicitis. An accurate knowledge of the normal percussion value of individual vertebræ, on the skeletal pleximetric principle, might often afford the means of detecting at an earlier date some of these centrally situated abnormalities—e.g., vertebral or glandular disease before the formation of paravertebral abscess, œsophageal or tracheal disease before the advent of perforation and of pulmonary gangrene, &c. The value of Grocco's triangular dulness for the diagnosis of empyema *versus* serous effusion, of supra-diaphragmatic *versus* infra-diaphragmatic fluid collections, &c., was still imperfectly understood, but was of growing practical importance. For stomach diagnosis a fresh departure was contained in the demonstration that normally the stomach was distantly accessible to our examination in the back. The percussion of the gastric nucleus would probably be regarded in the future as part of the routine of clinical examination. The existence, still practically unrecognised, of mainly dorsal varieties of gastric distension should render the dorsal examination indispensable in all "gastric" cases. Dr. Ewart urged that the evidence adduced (which also included a series of original tracings taken from the chest on transparent paper, showing the normal nucleus and its enlargements and deformities, and also its belt-like fusion with an enlarged Traube's semicircular resonance) might justify the plea for a systematic teaching of "dorsal" percussion and of "vertebral" percussion, and also the opinion that this would not be successfully accomplished until the prevailing prejudice against their only instrument of precision in percussion, a suitable pleximeter, was laid aside.—After Dr. A. M. GOSSAGE and Dr. BRUCE had spoken Dr. EWART replied.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—The new premises of this society were formally opened by Professor W. Osler on June 28th, in the presence of the principal physicians and surgeons in the city and the district around. There has been in the last year an increase of 60 in the membership, which now totals 180, justifying the acquisition of the new quarters, which are admirably adapted to the needs of the society. They include a large lecture-room, an excellent library, a capital billiard-room, and a card-room, and the premises will, therefore, serve the triple purpose of a library, a place of mutual instruction, and a club.—The President of the society (Dr. A. Fulton), who was supported by Dr. F. H. Jacob and Dr. H. Bell Tawse (honorary secretaries), recalled that the earliest record of the society was in 1828, when the Nottingham Book Club was founded. The meetings were at first held in the members' houses, and the first president was Dr. Howitt, whose family was still well represented in the membership. Later the books were removed to the office of the *Nottingham Journal*, and in 1835 the society moved to the Dispensary. In 1843 its title was changed to the present name, but the membership was not large. For a few years the society was in a state of suspended animation, until, in 1883, the present society was reconstructed, and many of the present members were at its birth. Again the meetings were at first held in the members' houses, and afterwards, till this year, at the Dispensary.—Professor Osler gave an address on the advantages to the profession and the public of unity and fellowship among medical men and the right method of keeping the general practitioner abreast of the modern developments. No men needed more acutely the benefit of coöperation, and yet they were notoriously difficult units to combine. They lived of necessity, after leaving the university, lives of isolation, of great loneliness, even in the cities, where a busy man might see very little of his colleagues. It was in the nature of the work, of course, that the physician must think of himself last, and the profession could never be organised on a commercial basis. It was difficult to combine the altruistic and the business sides of the work. The labourer was worthy of his hire, and in many callings obtained the cash equivalent, but that could never be so in the medical profession. Discord and jealousy often existed, largely owing to the attitude of the seniors towards the juniors, and Professor Osler laid down three rules for all: "Listen to no tales told by a patient of a doctor; believe no tale told of a doctor even if you know it to be true; tell no tale yourself, even if you are itching to do so." The medical society, he continued, should be a post-graduate school on a small or large scale, a sort of clearing-house of experience of the profession in any district. Good pathological specimens should be exhibited at each fortnightly meeting, and debates, among the younger men particularly, should be encouraged. The library was one of the most important things in connexion with the society, and he pointed out how it could be made to include all the new good medical literature. Secondly, the general hospital could be made a great factor in the organisation of the profession. They all needed advice and counsel, and the public needed first-class consulting physicians and surgeons. Such men could not be grown in a community without a first-class hospital, and it was for the profession to encourage the type of men who would do them best service in connexion with the general hospital. He should like to see the general hospital a consulting centre for the whole district, and the physician should take, not send, a difficult case there. The general hospital should be a genuine post-graduate school for the city and district in all departments, for a doctor without a post-graduate course was stale in five years, in a rut in ten years, out of which only a prolonged course would remove him, and in 20 years in a well, out of which nothing would bring him. There was no country in the world, said Professor Osler, in which there was such a high average of general excellence in the care of the patients in the hospitals as in England. Professor Osler, however, could not find words sufficient to condemn the general attitude in English hospital management towards the scientific side of medicine. In the public interest, to grow one's own consultants, and to enable the patients to receive the best out of the profession, there should be good pathological, clinical, and chemical laboratories, well equipped, each under paid officials of the hospitals.—A hearty vote of thanks was accorded Professor Osler, on the motion of Alderman Dr. F. R. Mutch, the oldest member of the society, seconded by Dr. C. H. Cattle.

LONDON COUNTY COUNCIL: MEDICAL APPOINTMENTS.—The Asylums Committee of the London County Council has appointed Dr. Percy Charles Spark, the medical superintendent of the Epileptic Colony at Epsom, to be medical superintendent of Banstead Asylum in succession to Dr. D. Johnston Jones. Miss Mary Amelia Pilliet, M.B., Ch.B., until recently assistant house surgeon at the Glasgow Royal Infirmary, has been appointed a woman inspector in the public health department of the London County Council under the Midwives Act, 1902. The salary is £250, rising to £350 a year.

Reviews and Notices of Books.

Constipation and Allied Intestinal Disorders. (Oxford Medical Publications.) By ARTHUR F. HERTZ, M.A., M.D. Oxon., M.R.C.P. Lond., Assistant Physician, Physician in Charge of the Electrical Department, and Demonstrator of Morbid Anatomy at Guy's Hospital; formerly Lecturer on Pharmacology at the University of Oxford; and Demonstrator of Pharmacology and Physiology at Guy's Hospital; formerly Radcliffe Travelling Fellow of the University of Oxford. London: Henry Frowde and Hodder and Stoughton. 1909. Pp. 344. Price 10*s.* 6*d.* net.

Dr. A. F. Hertz, as the result of his own researches and of a careful review of the literature of the subject, gives in the book before us a useful and an original study of the physiology and pathology of the intestinal movements in the human subject. He has made a scientific study of the causes underlying the common condition of constipation, and he discusses the means of diagnosis and the appropriate treatment of its various forms, endeavouring to place them on a rational basis. The important observations of W. B. Cannon upon the intestinal movements of cats and dogs by means of X-ray examinations after the administration of a meal containing bismuth salts have been systematically applied to man both in health and disease.

The first part of Dr. Hertz's book deals with the physiology of the intestinal movements and of defæcation. He was enabled to demonstrate the phenomenon of "segmentation" in the small intestine of man, analogous to the process described in animals by Cannon. He found in studying the progress of a bismuth meal by means of the X rays that the shadow of the cæcum is observed on an average in 4⅜ hours after the meal has been taken, the hepatic flexure being reached between 5 and 8 hours after the meal, the splenic flexure between 7 and 14 hours, and the junction of the descending colon with the iliac colon between 8 and 16 hours. An interesting observation was that which demonstrated the marked effect of the taking of food upon the motor activity of the colon, and upon the intestinal movements generally. A careful description of the processes concerned in the act of defæcation is given, and the composition and formation of fæces are discussed in relation to the parts played in these matters by food residues, intestinal secretions, and bacteria.

The second part of the book is devoted to a detailed analysis of the causes of constipation. In order to give a precise meaning to the word Dr. Hertz suggests that it should be defined as "a condition in which none of the residue of a meal taken eight hours after defæcation is excreted within 40 hours." To determine this he advises the administration of two or three charcoal lozenges with the experimental meal. He divides the cases of constipation into two classes: First, those in which it is due to the slow passage of food material through the intestines; and secondly, those in which there is no delay in the arrival of the fæces in the pelvic colon, but in which their final discharge by the act of defæcation is not adequately performed. For the second form he adopts the term "dyschezia," originally introduced by Dr. Robert Barnes to denote painful defæcation. These two main classes are further subdivided, and the part played by various factors in the production of the constipation is carefully discussed. Among the causes contributing to the first class we may mention weakness of the intestinal musculature, deficient reflex activity and inhibition of the motor functions of the intestine, obstruction by alterations in the character of the fæces, and by narrowing of the intestinal lumen. Dyschezia may be due to habitual disregard of the call to evacuate the rectum, to weakness of the voluntary muscles accessory to the act, to unfavourable postures, to hard and bulky fæces, functional and organic stricture of the rectum and anal canal, and other causes operating in the rectum. In uncomplicated cases of dyschezia, treatment by diet and purgatives is, as might be expected ineffective, and enemata are usually required.

The third part is given up to a detailed account of the symptoms of constipation and to a consideration of the various diseases associated with constipation. It also contains an interesting description of congenital idiopathic dilatation of the colon, or Hirschsprung's disease, including a review of its pathogenesis and treatment. The conditions included under the name of muco-membranous colitis are also dealt with at some length. Dr. Hertz is of opinion that mucous colic and mucous colitis are varieties of the same condition, and bear the same relation to one another that asthma does to asthma complicated with bronchitis.

The treatment of constipation is carefully dealt with in a thoroughly practical manner in the fourth part of the book. The importance of adapting the treatment to the particular variety of constipation from which the patient suffers and the value of preventive measures instead of the routine prescription of purgatives or enemata are both emphasised. Dr. Hertz discusses the actions of various aperient drugs, and states that his own observations do not confirm the ordinarily accepted interpretation of the action of saline purgatives. He believes that they are absorbed from the small intestine and that they act from the blood upon the neuro-muscular mechanism of the colon, increasing its secretory and motor activity. There are a chapter on the treatment of constipation in infants, and an appendix explaining the choice of the oxychloride of bismuth for the bismuth meals.

We can commend Dr. Hertz's book as a useful contribution to practical medicine and rational therapeutics.

Praktische Anleitung zur Ausführung des Biologischen Eiweissdifferenzierungsverfahrens, mit besonderer Berücksichtigung der forensischen Blut- und Fleischuntersuchung, sowie der Gewinnung präcipitierender Sera. Von Professor Dr. P. UHLENHUTH und Dr. O. WEIDANZ. Mit 35 Figuren im Text. Jena: Gustav Fischer. Price M.6.50. Pp. 246.

THE title is a long one, but it expresses accurately the aim of the authors—viz., to determine by means of the "biological reaction" the specifically different forms of proteid that exist in blood or in meat and its various preparations. Milk and mummies; blood of geese and duck, dog and fox, sheep and goat, horse and donkey; blood of insect, man, and ape; flesh, putrid, fresh, or dried; liver, spleen, and adrenals; beans, peas, lentils—all alike find congenial application in regard to the biological reaction. We have travelled a long way since 1890, when a specific antitoxin in the blood serum in animals infected with diphtheria was discovered. This led on to the discovery of agglutinins, precipitins, and hæmolysins. And now by means of the biological test or reaction it is possible to differentiate between proteins which cannot be differentiated by chemical means.

The first part of the work occupies about 130 pages and is devoted to the study of blood in its forensic or medio-legal and other aspects. When human blood is injected into an animal the serum of that animal yields a specific serum which causes a precipitate in human blood. Nuttall has used this test to show the affinity between man and the higher apes. He found that human blood precipitin serum caused a larger result in blood of the apes of the Old than in those of the New World. The authors' object, however, is a practical one—viz., to use the biological reaction as a test of human or other blood. It does not matter even if the blood has undergone putrefaction or is as dry as a crust. It is the proteins present which are the cause of the production of

the specific antiserum. It appears that the protein of the crystalline lens is the only animal protein known which gives no reaction with the specific antiserum. A very full account is given of all the known tests for blood by chemical means. Above and superior to all these the authors place the biological reaction. First determine that the substance to be investigated is blood, and it is possible to determine the source of the blood. The technique of the process is fully described by the authors, who go so far as to say that so certain is the method that it may be used in criminal cases with perfect assurance. They cite a large number of cases from the courts, including cases of murder, to prove the accuracy of their contention. This part of the book should be read by every medical jurist. The practice has been officially adopted in Prussia, Austria, Würtemberg, Baden, and Alsace.[1]

The second part of the work is merely an extension of the same method to the investigation of different kinds of flesh—e.g., horse-flesh. Very strict are the regulations regarding meat imported into Germany. In Germany itself, where sausages of all kinds are more extensively used than here, it is a question of supreme importance to determine if horse-flesh or other flesh is mixed fraudulently in their composition. The authors maintain that the biological test is equally applicable to all kinds of flesh. It appears that there are four kinds of horse-flesh sausage used in North Germany (p. 149)—a classification that might have stimulated the pungent wit of Heine himself.

In an appendix an interesting account is given of investigations on mummified flesh and on Egyptian mummies themselves. In the latter case Professor Uhlenhuth's results were negative, but mummified organs after 66 years yielded positive results. The whole work is singularly interesting and should be studied by all who have to deal with medico-legal matters as well as by public analysts. It contains an immense amount of information and its price places it within the reach of all.

Housing and Town Planning in Great Britain, being a Statement of the Statutory Provisions relating to the Housing of the Working Classes and to Town Planning, including the Housing, Town Planning, &c., Act, 1909. By W. ADDINGTON WILLIS, LL.B. Lond., Barrister-at-Law; joint author of Macmorran and Willis's "Law Relating to Sewers and Drains." London: Butterworth and Co. 1910. Octavo, pp. 201 + index, &c.

THE several statutes relating to the housing of the working classes now form such a complicated maze of cross references and inter-relations that clerks to district councils, medical officers of health, and, indeed, a large body of the lay public, will feel grateful to the author of this volume for the efforts which he has made to present the matter in a clear and by no means unattractive garb. The task which the author set himself, while avoiding undue detail, was "to weave together the whole of the existing legislation and to present the subject in such a form as, it is hoped, will be not only intelligible but also palatable." This was an ambitious and hazardous journey upon which to set out, and the chances of real success were remote. But although we opened the book with misgivings we must confess that, so far as is practicable in such an enterprise, the author has succeeded, and this in a relatively small space. Success was alone possible with a thoroughly intimate knowledge of the subject and the possession of a methodical mind.

The volume, which is light and runs only to a little over 200 pages in all, is divided into two parts. The first deals with the laws and procedure relative to the housing of the working classes, and brings out in a thoroughly understandable fashion the manner in which previously existing statutes have been modified by the Act of 1909. This portion of the work is preceded by a very useful table of statutes from the year 1838 up to the present time, as well as by an introduction treating of the outstanding features of the new measure. Part II. treats of town planning and provides a very readable synopsis of this part of the Act, while elaborate footnotes and references are furnished throughout. In view of the fact that nearly a third of the sections of the principal Act have been repealed by subsequent measures, inclusive of the recent Act, the numerous references furnished throughout are of special value It would, no doubt, have been preferable could there have been a new Housing Act embodying all previous legislation, for, as Mr. Willis observes, this legislation by means of amending Acts is clearly to be deplored. Still, no one who reads through the volume and appreciates the enormous power conferred by the Act of 1909 can question the desirability of proceeding with it rather than incurring further danger of shipwreck in the stormy and unknown channels of Parliamentary procedure. Certainly, as the author of the volume under notice remarks, the most striking characteristic of the new Act is the amazing power which it places in the hands of the Local Government Board, and in this aspect alone the measure must become of great historical importance. It is this substitution in truly drastic fashion of a Government department for Parliament and law courts which will have to be justified or the reverse, by the experience of the next few years. Such substitution must certainly be regarded as a very great compliment to the inspectors of the Local Government Board, whose public inquiries are models of patience and painstaking effort.

A Handbook for Midwives and Maternity Nurses. By COMYNS BERKELEY, B.A., M.B., B.C. Cantab., F.R.C.P. Lond., Obstetric Physician to the Middlesex Hospital, &c. With 58 illustrations. New and enlarged edition, with Appendices. London: Cassell and Co. 1909. Pp. 316. Price 5s.

THE fact that a second edition of this handbook has been called for so soon is proof that it has met with appreciation. In this edition the author has added three appendices, the first dealing with the symptoms of cancer of the uterus, the second with the revised rules of the Central Midwives Board so far as they relate to midwives, and the third containing the rules in force at the City of London Lying-in Hospital in the labour ward for hand disinfection, and vaginal examinations.

As Dr. Comyns Berkeley points out in the preface the question of the timely detection of cancer is one of the utmost importance, and it is most necessary that all women should be aware of the early symptoms of this disease. No doubt nurses and midwives can do a great deal in spreading such knowledge, and he is well advised, therefore, in taking the opportunity of the publication of this book, which no doubt will circulate widely among the members of this class, to call attention to these symptoms.

Perhaps the section of this handbook we should be inclined to agree with least is that on infant feeding. In our opinion home percentage feeding is quite unsuited to the ordinary nurse to carry out, and further than this, we have the greatest possible doubt whether in many cases the mixture in any way corresponds to the percentages which are laid down in the tables When we remember the very varying analyses given by any two samples of milk, and when we further bear in mind the fact that even when carried out by skilled operators these mixtures

[1] THE LANCET, June 18th, 1910, p. 1669.

are often far from accurate, it seems to us most unlikely that they are in any sense accurate when prepared at home. Nor, indeed, in our opinion, are they often necessary—a view which we believe is shared by most of those physicians who make a special study of infant feeding in this country. We are surprised to find no mention made of the method of feeding premature children with peptonised milk, one which gives the best possible results, not only for premature but also for full-term babies. We think the statement that a mixture of two parts of water to one part of condensed milk is the right proportion with which to feed a new-born baby may be erroneous requires some modification. The proportions depend, of course, upon the brand of condensed milk employed; but using an average brand of condensed milk, containing, as it does, about 16 per cent. of proteid, this would require dilution with eight times its weight of water to render it a suitable mixture for infant feeding, and then it would be, as condensed milks always are, grossly deficient in fat. We also demur at the recommendation that peptonised milk should be diluted according to the age of the child; one of the great advantages of the use of peptonised milk for infant feeding is that it requires very little dilution and can often be given undiluted.

As will be seen, we disagree with the author in some of his recommendations, but we can recommend the book cordially to midwives and nurses with the reservations we have made.

American Practice of Surgery. Edited by JOSEPH D. BRYANT, M.D., LL.D., and ALBERT H. BUCK, M.D., of New York City. Complete in eight volumes. Profusely illustrated. Vol. VI. New York: William Wood and Company. 1909. Pp. 916. Price $7 per volume.

SEVERAL subjects of great importance are considered in this sixth volume of the "American Practice of Surgery." The first section deals with mechanical appliances for the restoration of missing portions of the face, nose, and larynx. This is a most important subject chiefly on account of the high degree of success which has attended the efforts of those who devote themselves specially to this branch of surgery. We are indebted in no small degree to the work of American surgeons and mechanicians for many of the appliances which are now in use. Dr. Charles R. Turner of Philadelphia has written this chapter, and we are glad to be able to express complete approval of the manner in which he has fulfilled his task. The value of artificial dentures in the restoration of various functions such as mastication and speech is not fully appreciated, for in most cases the cosmetic purposes are considered of more importance. In many cases clefts of the palate are more satisfactorily treated by plates than by plastic operations, and this part of the subject is described fully. Artificial noses are also in many cases far preferable to the results of plastic operations, and the illustrations given show how well the artificial nose may simulate nature. The artificial larynx is in many cases of value, and the account given should prove of interest. After resection of the lower jaw some prosthetic appliance is generally required, and if properly chosen it proves of great value. An account of splints for fractured lower jaw is also given.

Dr. H. T. Mosher of Boston, Massachusetts, has dealt with the subjects of surgical diseases and wounds of the nasal cavities and accessory sinuses. Perhaps the most interesting portion of this chapter is that dealing with deformities of the nose; for a violently hooked nose the author prefers an external incision, through which he removes the amount of bone and cartilage required, and he tells us that an incision a quarter of an inch long is sufficient. The account of the method of injecting paraffin in saddle-back noses is too brief to be of any real value in practice. We would especially commend Dr. Mosher's account of the diseases of the accessory sinuses, and the illustrations which accompany it are excellent.

Dr. G. E. Armstrong of Montreal has contributed the chapter on surgical diseases and wounds of the mouth, tongue, and salivary glands. The account of malignant new growths of the tongue, which is admirably illustrated with some coloured pictures, is specially good and the bibliography concluding the chapter will be found useful.

Dr. John M. Elder of Montreal has dealt with the subject of surgical diseases and wounds of the neck. He gives some valuable illustrations of cervical ribs, and describes amongst other things the aneurysms affecting the carotid artery. Dr. Francis F. Shepherd of Montreal is responsible for the chapter on the surgical diseases of the thyroid and thymus glands. Goitre seems to be very common in French Canada, the New England States, and Mexico; as to its etiology the author says very positively that goitre is no doubt produced by a specific organism, and we agree that there is much to be said in favour of this theory. The description of the pathology of goitres is good. As to the treatment of exophthalmic goitre, Dr. Shepherd lays stress on the importance of operating only in properly selected cases, and he tells us that the more recent the case the less is the danger of the operation. An account is given of status lymphaticus, but the author contents himself with saying that it has been stated that to this cause may be attributed some of the sudden deaths which occur during anæsthesia.

Dr. Norman D. Carson of St. Louis has written the chapter dealing with the surgery of the thorax and spinal column. This is concerned mainly with the bony thorax and not with the surgery of the contents of the chest. The more important portion is that which treats of the surgery of the spinal column; it includes also the treatment of lateral curvature and of tumours of the spinal cord and its membranes. Dr. Harvey G. Mudd of St. Louis has contributed the account of the surgery of the female breast. He gives a very good account of the operations for malignant disease, and lays great emphasis on the need of extensive removal of the skin.

Dr. W. P. Graves of Boston, Massachusetts, has supplied the description of the surgery of the genital organs in the female. He appears to us to over-estimate the value of operations on lacerations of the cervix, but this is the only criticism suggested by his article. The surgery of the male genital organs has been contributed by Dr. Franklin G. Balch of Boston. We concur in the approval he expresses of Beck's operation for hypospadias. Dr. Hugh Cabot of Boston has described chancroid and gonorrhœal urethritis; he is in favour of irrigating the urethra in cases of acute urethritis, as are most of those who have had much experience in the treatment of this condition. In this section is also contained the surgery of stricture of the urethra.

An important chapter is that by Dr. Joseph C. Bloodgood of Baltimore on the surgery of the jaw, and this concludes the volume. The standard of the articles is high, and when finished the work will be a valuable contribution to the surgery of the day.

LIBRARY TABLE.

The Medical Annual: a Year-book of Treatment and Practitioner's Index. Bristol: John Wright and Sons, Limited. 1910. Pp. 991. Price 8*s.* 6*d.*—The present volume of this well-known publication forms the twenty-eighth issue. The high standard which has characterised its predecessors is well maintained, and the book is an excellent *résumé* of the work which has been carried out during the past year, especially in reference to practical medicine and surgery. The general mass of the book is occupied with a description of the advances which have been made in the treatment of disease, but in addition a few separate articles are

published dealing with special subjects. Dr. A. Butler Harris, medical officer of health to the Loughton urban district, contributes an article entitled "An Introduction to the Treatment by Bacterial Vaccines." He draws a clear distinction between "vaccine therapy" and "serum therapy," accepting Sir A. E. Wright's definition of the former—viz., "A vaccine is any chemical substance which when introduced into the organism causes there an elaboration of protective substances." Dr. Harris gives a brief summary of our knowledge on the subject of bacterial vaccines, which will well repay perusal. A short description of hormones is given by Dr. Emil Novak (Baltimore). Dr. Robert Simon (Paris) writes on "Injections of Sea-Water." A description is given of the preparation of sea-water for injection, and of the technique of its administration. Then follows an account of the therapeutic results which he has obtained in various disorders. He states that the rapid action of sea-water is seen to best advantage in newborn infants suffering from gastro-enteritis and malnutrition. He remarks that almost all physicians agree in forbidding those who suffer from inflammatory lesions of the skin to stay at the seaside, but, he says, it is quite otherwise with the injection of sea-water, and he contends that its action may be regarded as fairly well established in cases of eczema, psoriasis, varicose ulcer, and wounds of the skin, whether simple or specific. The accounts he gives of the progress of several cases, and the photographs which are reproduced exhibiting the cutaneous conditions before and after treatment, are certainly remarkable, and this therapeutic measure would undoubtedly seem worthy of more extended trial. The progress which has been made in radiology and electro-therapeutics is recorded by Dr. E. Reginald Morton. Special reference is made to the use of radium. He rightly speaks with due caution, for further experience is necessary before any definite conclusions can be arrived at, especially as regards its effect on cancer.

Umfang und Art des jugendlichen Krüppeltums in Deutschland. (*The Scope and Nature of Juvenile Deformity and of Measures for its Relief in Germany.*) By Dr. CONRAD BIESALSKI. With 12 illustrations and statistical tables. Hamburg: Leopold Voss. 1909. Pp. 484. Price 30 marks.—This work is the outcome of a statistical inquiry which was instituted in 1905 with the object of ascertaining the number of cripple children in the German Empire. The inquiry was confined to children of the poorer classes and was conducted on a social economic basis. The children who were interviewed on behalf of the census were, roughly speaking, classed under two headings—those who were *Heimbedürftig* and those who were *Nichtheimbedürftig;* in others words, those whom it would be impossible to benefit permanently otherwise than by institutional care, and those who were suitable cases for home treatment. To attain absolute accuracy in a statistical count of this nature over an enormous area amounts to a logical impossibility, but it may be safely accepted that the figures given err on the side of understatement rather than the reverse. It is, again, difficult to bring the term "cripple" within hard-and-fast margins. For the purposes of this inquiry, however, Dr. Biesalski defines a cripple as "an individual who is handicapped in the business of life either as the result of congenital imperfect bodily development, or of accident, or disease." The census is the first of its kind that has been carried out in any country, and much credit is due to Germany for the manner in which the difficulties which lay in the path of its accomplishment have been overcome. It was initiated by the German Central Children's Care Association in coöperation with the Berlin-Brandenburg Association for Cripple Care, and it received that measure of Imperial backing-up and practical and financial support which is never wanting in Germany where the interests of the national health are involved. The costs amounted to £730, towards which the Kultus-Ministerium contributed £150. The inquiry brought to light the following facts. In 1905 the population of Germany was 60,600,000, which included 21,000,000 children under 15 years of age. It was estimated that there were at least 75,000 cripples among the class of children who attend elementary schools, or that there were 15 of these cripples to every 10,000 of the population. Of these 15 children 8 were cases which could only be satisfactorily dealt with in an institution. Dr. Biesalski estimates that there are 56,000 children who are in need of skilled treatment. Germany has now 39 cripple homes with a total of 3371 beds, which shows how very much has already been done towards mitigating the miseries of crippled children in that country. Since the inquiry was set a-foot their number has largely increased, but there still remains a great deficiency of beds. To meet this deficiency Dr. Biesalski suggests that a cripple home with 200 beds should be forthcoming for every million of the population. A prominent feature in the proposed scheme is the teaching of suitable trades to crippled children and their training to habits of independence. 91 per cent. of the cripples tabulated were mentally normal; 16 per cent. were cases of infantile paralysis, in 15 per cent. of the cases the deformity was due to tuberculous lesions and in 9 per cent. to rachitis; 12 per cent. were cases of advanced scoliosis. Germany is now devoting much attention to scoliosis as a school disease, for which there exists ample reason, as it has been stated that hundreds of thousands of the 12,000,000 German school children suffer from it. Dr. Biesalski is to be congratulated on having brought an exceedingly arduous and tedious task to a successful conclusion, and his interesting publication is worthy of careful study. A valuable bibliography containing the titles of 237 works in different languages is appended.

Die Serodiagnose der Syphilis. By Dr. CARL BRUCK. Berlin: Julius Springer. 1909. Pp. 166. Price 4.80 marks.—The great importance attaching to a trustworthy serum reaction for syphilis makes this authoritative monograph from Wassermann's laboratory especially welcome. The volume is well arranged and the conclusions are clearly set forth, together with the large collections of statistics on which they are based. After a historical introduction, the author gives a review of the current theories as to the fundamental nature of the reaction. This depends on an immunity, established not against the spirochæta itself, but against certain products of its action on the animal organism. In this way is explained the fact that a positive reaction is obtained in trypanosomiasis, yaws, and leprosy. Chapter III. deals with technique, and supports the original method as against the newer simplifications and improvements. The crux of the whole procedure is, however, the preparation and control of the extract used as "antigen." This is liable to alteration on keeping, as is shown by Wassermann, Neisser, and Bruck's own work; and, given a competent antigen preparation, some of the simpler methods will probably be found to give results at least as satisfactory as the original method. 15 pages are devoted to diseases other than syphilis in which positive reactions have been observed. The onset of the reaction and its variations in different stages of the disease are treated in Chapter V. In experiments on apes it was found that a positive reaction usually appeared three or four weeks after infection, disappeared with the formation of the primary chancre, and soon came into evidence again with ever-increasing strength. The reaction was not found positive before the infection had become general, as shown by inoculation into a second ape of the organs of the animal

tested. In man the reaction becomes established a week or more after the primary sore, and was observed in about 70 per cent. of all primary cases. In the secondary stage about 94 per cent. of positive reactions were obtained, in the tertiary stage 80 per cent., and in latent syphilis 30 per cent. Chapter VI., on hereditary syphilis, suggests that when more observations are to hand we may have to alter somewhat our views on the transmission of the disease. The two last chapters are, perhaps, the most interesting in the book. The effect of specific treatment is to abolish the reaction, for a time at least, and it is urged that no treatment should be considered effective unless this has been accomplished. The reaction, once abolished, may, however, reappear, and this is to be regarded as a warning of a probable relapse. On these lines it is proposed to control treatment by systematic serum tests instead of using previously defined "courses," or of continuing treatment for a specified period from the disappearance of lesions. Of course, time will be required to test the value of this suggestion. Passing to consider the results of the test in various conditions, probably syphilitic in origin, a positive reaction is given by nearly all cases of general paralysis, aortic insufficiency, and aneurysm, and by a large percentage of tabetics and cases of aortitis. Similarly interesting results are found in ophthalmological and laryngological practice. There follow an appendix and an excellent bibliography.

Kompendium der Roentgen Therapie. (*Compendium of Roentgen Ray Treatment.*) Von Dr. H. E. SCHMIDT, Berlin. Second, enlarged, edition. With 36 illustrations. Berlin: August Hirschwald. 1909. Pp. 158. Price 3 marks.—This is a convenient little work intended for the use of those who wish to understand the theory of application of X rays in treatment. The first 50 pages contain a short, but on the whole sufficient, account of the technical side, the various portions of the apparatus being described, the source of the primary current, the coil, the break, and the tubes being taken in turn. The second part, and on the whole the more important, begins with an account of the action of the rays on the normal tissues of the body, while the harmful effects which may follow the use of Roentgen rays are discussed. Then come indications for treatment. In the first place are considered those diseases of the skin for which X rays have been employed. On the whole, the claims made for success are fully justified, though here and there, as might be expected, a little more benefit is attributed to the rays than all would be willing to admit as proven. Following this section we find an account of the use of the rays for diseases of internal organs, and here also there is a little disposition to overvalue the power of the rays. We are learning every year to apprise more exactly the power and the limitation of the Roentgen rays, and this small work will bring home to the reader the value of the therapeutic effects resulting from Roentgen's discovery.

CENTRAL MIDWIVES BOARD.

A MEETING of the Central Midwives Board was held at Caxton House, Westminster, on June 30th, with Sir FRANCIS CHAMPNEYS in the chair. The following resolution was unanimously passed:—

That the hearty congratulations of this Board be accorded to its chairman on the distinguished honour conferred on him by the King, an honour they feel he so well deserved for the dignity, courtesy, and impartiality with which he has presided over the Board's deliberations since its commencement.

A letter was considered from Miss F. M. Bernard-Boyce, inspector of midwives for the county of Norfolk, stating that the period of suspension for the purpose of disinfection in that county has now been reduced to seven days. The Board passed the following resolution:—

The Board considers that it is unfortunate that the arrangements for disinfection in the county of Norfolk are so far from adequate, and hopes that they will be provided without delay.

A second letter was considered from Miss Bernard-Boyce inquiring whether the local supervising authority has power to suspend a midwife for the purpose of preventing the spread of infection, on the ground that she has been in attendance on a case of puerperal fever as a maternity nurse and not as a midwife. The Board decided that Miss Bernard-Boyce be informed that the local supervising authority has power to suspend a midwife in the circumstances mentioned.

A third letter was considered from Miss Bernard-Boyce suggesting that women whose names have been removed from the roll on their own application should be entitled to receive from the Board a document vouching that they had been duly certified by the Board, and that being desirous of retiring from practice they had voluntarily resigned their certificate. The Board decided that in the case of certificates voluntarily surrendered the cancellation should be effected by writing across the face of the certificate the words, "Cancelled at her own request." The certificate may then be returned to the holder.

A letter was considered from the Right Honourable G. W. Palmer, of Marlston House, Newbury, as to the difficulty of maintaining midwives in country districts by voluntary efforts, and the necessity of their provision by the State. The Board instructed the secretary to reply that the Board had considered the question at the instance of the President of the Local Government Board, and thought that it was desirable that the State should subsidise midwives for poor and sparsely populated districts unreached by existing institutions.

A letter was considered from the British Medical Association as to the danger of midwives employing their pupils as substitutes, and suggesting that a midwife should be made directly responsible for any misconduct on the part of her pupil. The Board decided that the British Medical Association be informed that a midwife employing a pupil is already responsible to the Central Midwives Board for any breach of the rules by her pupils.

A letter was considered from Mr. J. Lloyd Davies of Newport, Mon., complaining of the conduct of a certified midwife. The Board agreed that Mr. Lloyd Davies be informed: (1) That as regards the complaint it does not appear to come under the jurisdiction of the Board; (2) that as regards the alleged breach of the Board's rules on the part of the midwife, the proper quarter to which complaint should be made in the first instance is the local supervising authority. If that body finds a *primâ facie* case within the meaning of Section 8 (2) of the Midwives Act to be established against the midwife the Board would then proceed to deal with the matter.

A letter was considered from Sir Donald MacAlister, President of the General Medical Council, as to the practice of midwifery by unqualified men. The Board decided that a copy of the Board's resolution of May 26th, 1910, dealing with the practice of midwifery by unqualified men, be forwarded to the President of the General Medical Council.

A letter was considered from the clerk of the Worcestershire county council, suggesting an amendment of Clause 17 of the Midwives Bill, 1910. The Board suggested that the Worcestershire county council should communicate direct with the Privy Council on the subject of the amendment of Clause 17 of the Midwives Bill, 1910.

Correspondence which had passed between the Secretary and the Monmouthshire training centre for midwives as to an application by that body for the grant of exemption from supervision by the local supervising authority was considered. The Board directed that the secretary's reply, pointing out that the Board has no power to grant exemption from supervision further than that which is automatically conferred by Rules E. 24 and 25, be confirmed.

ROYAL ALBERT HOSPITAL, DEVONPORT.—As a result of a "street demonstration" which was recently held at Devonport in aid of the Royal Albert Hospital the sum of £60 has been raised for the funds of that institution.

THE LANCET.

LONDON: SATURDAY, JULY 9, 1910.

The Prevention of Consumption.

WE pointed out last week that the duty of the public in regard to the tuberculosis problem was not discharged with any general enthusiasm, the main problem in the combat against tuberculosis being to arouse the nation from its apathy and indifference in the matter. There can be no doubt, however, that the National Association for the Prevention of Consumption and Other Forms of Tuberculosis are really now making an impression upon the public mind, and the important conference just held in Edinburgh will bear valuable fruit. The public will see and appreciate that the annual meeting of the conference this year has coincided in a remarkable manner with the full fruition of the Edinburgh scheme of dealing with tuberculosis. Within the last few months something like a definite working coöperation has been established between the Royal Victoria Dispensary and the Public Health Department of the city, and a yearly financial grant has been given by the municipal authorities which will permit an increased staffing and an extended working of the dispensary. A farm colony at Springfield, Lasswade, in connexion with the hospital has now sprung into being. The city of Edinburgh has thus obtained the following coördinated plan of dealing with the problem of tuberculosis—the Royal Victoria Hospital for the treatment of early cases, supplemented by the farm colony at Springfield for cases where an extended therapeusis with graduated exercise is required; pavilions and shelters in the City Hospital for the isolation and treatment of advanced cases; the tuberculosis dispensary, which, along with the public health department, form the central bureau for the collection of information regarding the distribution of the disease, for the administrative control of cases, for supervision of contacts, for disinfection and general sanitary measures, and for education of the patients and their friends in preventive measures and in treatment. In that scheme the dispensary is the centre connecting all the other activities. From the point of view of therapeutics merely it is the important coördinating part of the machine, but in the larger question of prevention its work is even more valuable and predominating. The original conception of the dispensary, and of its place in an organisation dealing with tuberculosis, is due to Dr. R. W. PHILIP. Dr. HERMANN BIGGS, the well-known American physician, speaking at the annual meeting of the Royal Victoria Hospital on Friday, July 1st, paid a just tribute to this work when he said "that Dr. PHILIP initiated the movement for the prevention of tuberculosis by the establishment of the tuberculosis dispensary 23 years ago in Edinburgh. From that beginning there had been gradually elaborated in Edinburgh a scheme which might now, he believed, be considered the most complete in the world. That had been done to a very large extent through the voluntary efforts of Dr. PHILIP and his co-workers, and those who had so generously contributed to the work." This is bountiful praise, but none the less deserved.

It is to be hoped that other great and thickly populated communities suffering from the scourge of tuberculosis will soon be in a position to announce the possession of an inclusive and coördinated scheme, under which prevention and treatment can proceed hand in hand in an orderly manner, intelligible to the public; for when the people understand how much is being done in the fight against tuberculosis as well as how much more can be done the rout of a terrible foe will be assured. The publicity which is at present being given to the subject of tuberculosis in the lay press renders it a matter of great importance that the funds subscribed and the enthusiasm awakened shall be directed into the most profitable channels, and that not all of it shall be expended in a somewhat one-sided campaign against the bacillus, leaving the opsonic index of the patient to look after itself. All authorities on the subject are agreed that tuberculosis is very largely a social disease, intimately bound up in one way or another with the problems of poverty and notably with the housing and feeding of the poorer classes. It is unnecessary here to waste time in arguments as to the precise manner in which housing acts; it suffices to know that tuberculosis is found in intimate association with back-to-back houses, overcrowding, and under-feeding, and that the removal of these states and conditions is followed by a diminished death-rate from pulmonary tuberculosis. So much is this the case that could there be a general crusade both in urban and rural districts against bad housing a greater effect, in the opinion of many persons qualified to judge, would probably be produced upon the rapidly declining tuberculous death-rates than would be likely to ensue from any other single event—greater, perhaps, than might be expected from all the other agents of prevention combined. The remarkable fall in the mortality from pulmonary tuberculosis which took place amongst the Guards as the result of increased cubic space in barracks and better ventilation, and the fall in the death-rate amongst prisoners in response to more wholesome surroundings, might be held to suggest to some minds that the best way to become immune to tuberculosis would be to enter the army or a prison. But a more modern illustration of the value of better housing in promoting an almost phenomenal decline in the mortality of tuberculosis was drawn attention to in THE LANCET last week in an article by our Special Sanitary Commissioner, in which he treats in interesting and historical fashion of the housing problem at Liverpool. His story of how the slums were first attacked will be read with appreciation by all who have had to do with housing problems and the administration of local Housing Acts; especially will that portion of the article which tells of the housing of the slum-dwellers appeal to those who have been practically concerned with housing schemes. These schemes usually result, not so much in the re-housing of the actual slum-dwellers themselves as in providing good accommodation for a certain number of

respectable persons very few of whom were inmates of the slum property destroyed. But in the case of Liverpool it has been necessary, in order to be accepted as a tenant of the municipal dwellings referred to, to furnish evidence that the occupant really inhabited one of the houses demolished by the sanitary authorities, or that he was proceeded against as a dweller in overcrowded or insanitary property, or that he was turned out of a cellar dwelling. To some extent the statistical conclusions arrived at with reference to tuberculosis are open to criticism by the rather amusing circumstance that the advantages of being a municipal tenant have induced several persons to deliberately overcrowd their houses or, to live in cellar dwellings, in the hope of being proceeded against by the sanitary authority and thereby of qualifying for admission to the municipal elysium.

The experience gained in Liverpool in the generous re-housing of the submerged would seem, according to our correspondent, to be of hopeful augury. The municipal tenements are, he tells us, the scene of a veritable process of resuscitation, both moral and physical. With respect to the mortality from pulmonary tuberculosis we have the high authority of Dr. E. W. HOPE, the medical officer of health of Liverpool, to the effect that in these new habitations, notwithstanding the deplorable history of the occupiers, the rate amounted to but 1·35 per 1000 in 1907–08, a figure which was lower than that for the city as a whole, and much below that of the districts in which the municipal dwellings are situated. If, as is alleged, these people are really all the old slum dwellers, the figure is extremely hopeful, although the rate relates to one year only. The National Association for the Prevention of Consumption, now, we are glad to think, so much in the public eye, are sure to turn their attention and some of their energy to stimulating local authorities throughout the country to a better sense of their responsibility relating to the housing problem. We are glad to see that the association are sending round to their subscribers and others copies of the truly statesmanlike address delivered by Mr. JOHN BURNS at the Whitechapel Tuberculosis Exhibition in June of last year, and the President of the Local Government Board is to be cordially congratulated upon the fact that the hope then expressed by him that before the session then in progress closed the Housing Bill would be upon the statute book has since been realised. No single measure could do more for the decline of tuberculosis than this Act energetically and intelligently administered. In his last annual report Dr. HOPE, while commenting upon the statistics dealt with above, observes that "no practical sanitarian would suggest that if, instead of spending the money in demolishing the slums, purchasing the sites, and erecting the dwellings, it had been spent in providing sanatoria and in removing and maintaining the diseased people therein, the results would have been at all comparable either in benefit to the city or to the inmates of the dwellings themselves." But the work of abolishing the slums, which is going forward vigorously, is mainly preventive in its purpose, and we have among us an enormous crowd of infected persons still amenable to curative measures; and while our great urban communities must not slacken in their efforts at re-housing, they should also strive to deal with the problem of treatment in the comprehensive way that is being accomplished in Edinburgh.

The London County Council and the Medical Treatment of School Children.

WE are not disposed to congratulate the London County Council upon the position which it has taken up with regard to the medical treatment of the children in its public elementary schools. We published in our issue of July 2nd, p. 50, a report of a recent meeting of the Council at which there came up for discussion estimates for the maintenance of public education in London, and at which proposals were made for the increase of these with a view to the provision in certain cases of treatment calculated to remedy defective physical conditions in children under the care of the Council as education authority. For many years public elementary education existed without that direct legalisation of the medical inspection of school children which those interested in the matter felt to be desirable, and which under some school boards was introduced tentatively and at some risk of its being found to be beyond their powers to institute or to pay for. Whatever the true legal position may have been, no serious exception, we believe, was taken to the innovation, and now the medical inspection of children is a means recognised by the law by which an education authority may render its work more useful to the public. At the same time such inspection necessarily draws attention to conditions the remedies for which ought undoubtedly to be supplied by the parents where they are able to do so, which will be so supplied where the parents are not only comparatively well-to-do but anxious to perform their duty towards their offspring, but which certainly cannot be paid for in the case of a large class of parents, and will not be where they are indifferent. What, then, is the duty of the community as represented in this case by the education authority, when the inspection of its medical officer points to remediable defects in children, which if left to exist, and perhaps to develop, without interference will inevitably have marked results of defectiveness when the children grow up?

The more immediate duty of the community, it will be said, is towards the children themselves, with whose education it has charged itself, and whose capacity for instruction may suffer if, for example, their defective teeth cause them to lapse into ill-health or their defective eyesight hinders them in learning to read and write. The more important duty of the State, or civic unit, however, when the matter is looked at from a broader standpoint of principle, is towards itself and towards the maintenance of its own position in the future. It has to consider the coming generation of adults represented by the children of the day and to bring them to the age of citizenship as men and women capable of being, and of breeding in their turn, worthy and independent

citizens. Elementary education is provided for out of the public funds for no other object, and all reasonable means should be taken to secure that end and to prevent educational effort and expenditure from being wasted. The whole matter, no doubt, depends upon the answer to the question what is reasonable when all the circumstances are considered. Parents have duties which the State should not lightly undertake in their place. The cost of public elementary education has grown enormously during recent years, and the results secured are not so striking, in the opinion of many, as to justify further expenditure upon matters which are but indirectly connected with education and to which the attention of our fathers was never directed at all. These are considerations which no doubt weighed with the majority upon the London County Council when the votes referred to were taken. Let us hope that they considered each case carefully as individual councillors and criticised every amendment upon its merits without reference to any question of adherence to a policy adopted and enforced upon its members by a municipal party. Against the view which they expressed it may be pointed out, and indeed it was pointed out to them, that the ranks of the unemployed and unemployable, who at a maturer age become dependent on the rates not for their education but for their entire maintenance, are largely recruited from those who grow up from a physically defective childhood into physically and intellectually defective men and women.

It may not be an ideal course to spend money in supplying to the children of the poorer classes treatment which we know they are in need of, and to do so out of rates which are largely paid by those who derive no direct benefit from the provision of public elementary education. We do not, however, live in an ideal state, but in one in which the practical defects of everyday human existence are painfully apparent. We have to select frequently the least objectionable of two courses, neither of which would commend itself to us if we had a free choice, and it must surely be better to secure by a comparatively small additional expenditure the fullest possible effect for a great payment which we have bound ourselves to make, and from which we expect and desire to obtain important advantages. We are spending a huge sum annually on education and a comparatively small sum on medical work, which, so far as it consists of inspection only, just serves to put us in the mortifying position of seeing where our loss and waste take place without enabling us to prevent them. Meanwhile, we spend every year a no less formidable amount on maintaining those who, if our medical inspection were to be reinforced by treatment, might in future generations be represented by independent workers earning their living for themselves. Possibly the London County Council will one day modify an attitude which we regret, and take the lead in a movement capable of effecting results of lasting benefit to the country. Whether treatment is made by arrangement with hospitals or by a development of clinics it will require money, and the fact that there is no exact consensus of opinion as to the best way in which the money should be spent does not relieve the London County Council wholly of the onus of finding some more adequate supplies.

The Census and Estimates of Population.

THE refusal of the Government, under Treasury influence, to make provision for an intermediate quinquennial enumeration of the number, sex, and age of the population of the United Kingdom in 1916 is seriously discouraging to medical officers of health and others who cannot fail to recognise the inadequacy of a decennial Census as the basis of trustworthy vital statistics, which are so essential for the promotion of local health progress. The results of the last three Censuses have abundantly proved the wide, nay, incalculable, fluctuations in the rate of the growth of population in the large towns in England and Scotland, and the consequent depreciation of the value of their vital statistics during the latter half of an intercensal period of ten years. It is, moreover, impossible to doubt that since the last Census in 1901, quite apart from greatly increased emigration, various causes have operated exceptionally to affect the growth of our large towns and to distribute it more widely beyond their arbitrary administrative boundaries, thus causing a very general reduction of the rate of increase of population that prevailed during the last intercensal period, 1891–1901. As a natural consequence of this obvious decline in the rate of increase, the population of many of our large towns is now very considerably over-estimated by the official method of assuming that the rate of increase prevailing between 1891 and 1901 has been maintained during the current intercensal period.

In the Registrar-General's Annual Summary for 1909, recently issued, it is assumed, for example, that the population of the County of London had increased by 288,955 during the eight years preceding the middle of last year, equal to an increase of 6·3 per cent. The rate of increase of the population within the County of London during the last three completed intercensal periods since 1871 was successively 17·4, 10·4, and 7·3 per cent., thus showing a continually increasing decline in the rate of increase of population. Moreover, a special intermediate London Census was taken in 1896, which showed that while the increase of the population of the County of London was equal to 4·8 per cent. in the five years 1891–96, it declined to 2·4 per cent. in the following five years 1896–1901. These facts make it impossible to accept as trustworthy the assumed increase of 6·3 per cent. in the London population during the eight years 1901–09, and no one who considers the subject can well doubt that the London population is at the present time very considerably over-estimated, and that consequently the recently published rates of marriages, births, and deaths in London are distinctly understated. Probably still larger over-estimates of population are now being used in the construction of official and local vital statistics for the metropolitan suburban districts of Willesden, Hornsey, East Ham, and Walthamstow, where very exceptionally high rates of increase prevailed during the ten years 1891–1901, the maintenance of which it seems unreasonable to assume.

Bearing in mind the constantly increasing importance of approximately correct estimates of the number, sex, and ages of our population for education, trade and commerce, and for other branches of State administration, as well as for

the promotion of public health, it is matter for surprise, as much as for disappointment, that Parliament has so far failed to recognise the necessity for securing an intermediate enumeration of our population in 1916. We have taken as a matter of convenience the County of London as an example of a community whose vital statistics are probably vitiated by an incorrect estimate of the population; it would have been easy to mention cities where this very point has given rise to serious disagreements in medical opinion.

Annotations.

"Ne quid nimis."

MALTA FEVER AND GOATS' MILK.

WHEN Sir David Bruce and his colleagues on the Malta Fever Commission reported that the disease was spread in Malta mainly by goats' milk, and that the boiling of that fluid before use was sufficient to prevent the infection, there were not wanting some persons in this country and in Malta who scoffed at so simple a solution of what had hitherto been considered an obscure problem. But the adoption of this precaution in the barracks and hospitals of Malta has resulted, as is now well known, in an almost complete disappearance of the disease from the naval and military garrison of the island, in this way clearly demonstrating the correctness of the conclusions arrived at by the Commission. It has been quite recently announced in Parliament that the inquiry is to be carried a step further by the appointing of a fresh Commission to investigate the manner in which goats become infected by the Micrococcus melitensis. In this connexion it is of interest to remark that reports from various sources tend to prove that Malta fever has a much wider distribution than was formerly believed; and lately accounts received from France show that the disease has appeared at a number of places in that country, particularly in the departments of Var, Bouches-du-Rhône, Hérault, and Gard. It has been suggested that these recent outbreaks in France are probably associated with the importation of Maltese goats through Marseilles, where an agency for the purpose is established, the goats from Malta being especially sought after on account of their superior milk-giving qualities. An account of a recent epidemic of this kind, involving both man and goat, is given in the current number of the *Annales de l'Institut Pasteur*,[1] the investigation having been carried out with the assistance of a subvention from that institution. The scene of the outbreak was a sparsely populated and remote district situated on the outlying spurs of the Cevennes, inhabited by agriculturists of the poor peasant class living in isolated cottages or small farms, each family keeping one goat or more to supply them with milk. No cows or horses were kept, the only other animals raised by the peasants being pigs, poultry, and rabbits, though some of the better off people kept a few sheep. In this remote region an epizootic appeared in December, 1908, among the goats, of which, it was ascertained during the inquiry, 164 had suffered; of these no fewer than 63 aborted. In January a sudden and severe outbreak of illness, diagnosed at first as "infectious influenza," attacked the peasants, of whom some 179 suffered. It was remarked that the epizootic of the goats and the epidemic in man were both limited to a well-defined area comprising three parishes somewhat shut off by the physical characters of the country from the adjacent communes. Owing to the protracted nature of the illness, in some instances lasting several months, suspicion was aroused that the prevalent malady might be Malta fever. As a preliminary measure specimens of the blood of five convalescent patients were sent to an expert for examination, and he reported that the serum in four instances agglutinated the micrococcus melitensis in dilutions of 1 in 20 and 1 in 60. The main investigations were made more than nine months after the occurrence of the outbreak, but it was found that in 75 out of 80 cases in which the agglutination test was tried, a positive result was obtained. A modification of the agglutination test was employed for the goats' blood, and of the 63 goats which had aborted during the period in which the epizootic prevailed it was found that 71 per cent. gave positive results. The blood also of 96 rabbits was tested, and in 20 of them agglutination occurred. The goats and rabbits, it may be mentioned, were housed in the same sheds under extremely filthy conditions. In the districts surrounding the infected zone no similar illness in man or animals had been observed, and none of the goats had aborted. The houses where the goats were kept in the three communes which suffered from the illness were scattered, singly or in small groups, over a somewhat wide and hilly area, and had few conditions common to them all. But in August and September 146 goats out of 164 attacked had been taken to a particular farm within the affected area to be covered by a buck goat kept there. Although the precise manner in which the farm came to act as a focus of the infection has not been ascertained, it is surmised that a recently purchased goat from a distance had been brought to the farm and had set the mischief agoing. The investigators of the outbreak were satisfied that the disease which attacked the goats in December was Malta fever and was the same as that from which the peasants and their families suffered in January, and that the infection was conveyed to man by means of the goats' milk. With a view to prevent such occurrences it is recommended that traffic in Maltese goats should be strictly controlled at Marseilles, so as to secure that no infected animal will be permitted to enter France. It is also suggested that a series of investigations should be undertaken to discover how long the micrococcus melitensis can survive in the cheese which is made from goats' milk, and which may possibly be a cause of the spread of the disease.

[1] Une Épidémie de Fièvre de Malte dans le Département du Gard; Contribution à l'Épidémiologie de la Fièvre de Malte en France; par MM. P. Aubert, P. Cantaloupe, et E. Thibault, Annales de l'Institut Pasteur, tome xxiv., No. 5, 1910.

LIVE AND DEAD WEIGHT.

THERE is a popular notion that the weight of the living body is less than that of the dead one. In a recent issue of the *Pioneer Mail* a correspondent discusses this question in connexion with the behaviour of a crocodile which he shot dead while it was basking asleep on a quicksand. When shot the crocodile began to sink and almost disappeared before it could be reached. The correspondent is clearly inclined to accept the popular notion of an increase of weight at death but for the fact that "recent experiments undertaken by some learned authorities in America had proved that a dead body was lighter than a living one. From this they (the learned authorities) deduced that the soul had a definite weight in pounds avoirdupois." It is possible that some of our readers are unfamiliar with the experiments to which the correspondent of the *Pioneer Mail* refers. They will be found in *American Medicine* for 1907, New Series, Vol. II., p. 240, and were made and recorded by Dr. Duncan Macdougall of Haverhill, Mass. Patients were weighed in the act of dying. The scales used recorded any increase or decrease beyond the fifth of an

ounce—not a particularly delicate instrument for estimating the weight of that part of the living body which is usually regarded as immaterial and imponderable. In the first of a series of six experiments Dr. Macdougall placed a man dying from pulmonary tuberculosis on the scales. The patient lost weight at the rate of one-sixtieth of an ounce per minute until the moment of death, when "the beam end dropped with an audible stroke," showing a sudden decrease of three-quarters of an ounce in weight. What was the cause of the sudden decrease? Dr. Macdougall, after excluding the loss due to escape of breath and fluid contents of the body by evaporation or other natural means, concluded that the marked and sudden decrease was due to escape of the "soul-substance." In this particular instance the "soul" was evidently a very material one, weighing three-quarters of an ounce. The experimenter extended his observations to dogs, but the results gained were negative. At the moment of death the dog's body refused to show any alteration in weight. We are of opinion that the correspondent of the *Pioneer Mail* in seeking to explain the disappearance of the shot crocodile in a quicksand, need not take his "learned authorities" too seriously. Dr. Macdougall's observations are to be explained by a peculiar bias on the part of his scales or on the part of the "friends" who assisted him. At least the scales used by other investigators have refused to reveal any sudden diminution in the weight of the body at death. In the usual acceptation of the term, "death" occurs when respiration and circulation have ceased, but in a more strict sense the death of the body is gradual, the muscular system, for instance, being really alive some hours after the apparent death of the individual.

RECURRENCE AFTER REMOVAL OF INNOCENT TUMOURS OF THE BREAST.

IN the *Edinburgh Medical Journal* for June Sir George T. Beatson has called attention to the fact that recurrence after removal of tumour of the breast is not, as is generally supposed, distinctive of malignancy. He reports the two following examples. A married woman, aged 35 years, who had one child, was admitted into hospital with a swelling of the right breast. She had noticed it about four months, and in the last three weeks it had grown rapidly. Three years before a small tumour had been removed from the upper part of the same breast. Examination showed a hard, somewhat nodular, tumour in the lower and outer quadrant, which was moveable with the breast over the pectoral muscles. The skin was not adherent to the growth, the nipple was not retracted, and enlarged glands could not be felt in the axilla. On Oct. 31st, 1901, an incision was made, and both the tumour and breast were found to be cystic. The whole breast was therefore removed. The pathologist reported that the breast was the seat of that variety of cystic disease characterised by intra-cystic growths. Good recovery followed, and the patient was not seen again until November, 1908, when she sought advice for a small hard nodule in the outer edge of the great right pectoral muscle near the scar. She noticed this first five months previously, and it was becoming larger. She was in excellent health. On operation the tumour was found embedded in the fibres of the great pectoral muscle, some of which were removed with it. When cut into it proved to be cystic and contained dark sanguineous fluid. Dr. J. H. Teacher made the following report on the specimen: "There is a solid mass within a thin-walled cyst. The mass presents the characters of an intra-cystic adenoma (or in parts papilloma). Although it is very cellular I am of the opinion that it is innocent." In the other case a woman, aged 56 years, was suffering from rapidly growing tumour of the right breast. On Dec. 23rd, 1907, an operation was performed. The tumour was encapsuled, the mammary tissue being pushed aside and thinned. The whole breast was removed, but the axilla was not interfered with, as the glands did not appear to be infected. The pathological report was that the tumour was a fibro-adenoma with the stroma in an active state, as shown by its cellular character, and that the glandular acini in it were dilated and lined with layers of epithelium. On Feb. 11th, 1910, the patient was readmitted with a hard swelling on the inner side of the scar. She had remained well until six or eight weeks previously, when she noticed a small hard lump near the scar. It gradually enlarged and at times was painful. She looked healthy and well nourished. The tumour was of the size of an orange and consisted of two rounded portions with a depression between. It was moveable on the deep structures, but on movement there was slight puckering of the skin over the upper part. The tumour was removed and Professor R. Muir reported on it as follows. "The tumour is an adenoma, the acini being comparatively few and large. They are lined by a single or double layer of epithelium. There is no trace of epithelial infiltration. The stroma is very abundant and cellular and almost sarcomatous in appearance. The tumour corresponds to the 'adenoma-sarcoma' of writers, but I doubt if it is malignant. The stroma is more cellular, and there is less epithelium than on the previous occasion." This favourable report was at variance with the clinical history, which indicated malignancy. Sir George Beatson thinks that the first case furnishes an explanation which may harmonise them. In the first case the second tumour was not due to incomplete removal of the primary tumour, but to cystic degeneration after an interval of years of a remnant of the parenchyma of the mammary gland. Recent investigations have shown that the gland has a much wider distribution than was supposed and that ramifications extend in all directions, even into the substance of the great pectoral muscle. In the second case probably the same kind of growth as occurred primarily in the main body of the breast manifested itself after an interval in an outlying portion left behind. Sir George Beatson also suggests that the cancerous nodules which appear near the scar many years after operation for cancer of the breast arise from portions of normal mammary tissue left behind. If, as is usually held, they are due to incomplete removal of the primary tumour, it is difficult to understand their prolonged latency.

THE CO-EDUCATION OF MEN AND WOMEN AS STUDENTS OF MEDICINE.

WE published a leading article in THE LANCET of May 21st referring to the suggestion in the April number of the *London Hospital Gazette* that women medical students should be admitted as students at the London Hospital Medical School and generally to the service of the London Hospital. In the June number of the *Magazine of the London (Royal Free Hospital) School of Medicine for Women* there is a letter from the editor of the magazine (Dr. Mary A. Blair) expressing surprise on learning from the *London Hospital Gazette* that there is a proposal to open the London Hospital to women medical students. Dr. Blair writes: "We are even more surprised to hear it suggested that there must have been considerable demand for it on the part of the women!" for she thinks that there can be no general requirement of the sort among the women medical students of London, while the innovation would inevitably damage the Royal Free Hospital. On this point she writes that "the removal of 10 or 12 students yearly to another medical school would be a serious financial loss to a school of the size of our own, and would

undoubtedly diminish the efficiency of our medical school." Finally she says, "we consider it more desirable that women should be trained apart from men." Dr. Blair's statements certainly merit careful consideration from those authorities contemplating widening the scope for the medical education of women. We are not prepared to dogmatise on the broad questions involved, taking for our example the particular and present position of women medical students in London, but we must not be blind to the fact that there is a rapidly widening demand nowadays for outlets for the superabundant energies of women. Hospital authorities will naturally feel reluctant to attempt to stem, even if they wished so to do, what is the manifest current of progress desired by educated women.

THE PHARMACY OF THE BRITISH PHARMACOPŒIA.

THE second report of the Committee of Reference in Pharmacy to the Pharmacopœia Committee of the General Medical Council has been published in order that its suggestions may be submitted for professional criticism. It embodies the results of work accomplished in connexion with the revision of the British Pharmacopœia from Nov. 18th, 1908, to Dec. 16th, 1909, together with recommendations supplementary to those contained in the previous report of 1908. The first report dealt with the monographs from Acaciæ gummi to Extractum gentianæ, and included a series of suggested alterations in the tests for lead and an appendix on the quantitative colorimetric lead test. The present report deals with the monographs from Extractum glycyrrhizæ liquidum to Liquor magnesii carbonatis, and in addition suggests a new monograph for Extractum belladonnæ liquidum and gives a general description of the process of repercolation which, it is suggested, should be introduced into the appendix. It is evident from the carefully detailed suggestions for alterations in the various monographs that the committee have expended a large amount of time and brought experienced consideration to bear upon the work entrusted to them. In the opinion of the committee the present formula for extractum glycyrrhizæ liquidum should be retained, but they suggest an improved method of working the official process by which the acidity that rapidly develops in hot weather may be avoided. The monograph on extractum ipecacuanhæ liquidum, which it is proposed to substitute for the present one, does away with the use of lime and produces a liquid extract containing 2 grains of the alkaloids of ipecacuanha root in 110 minims. In the proposed new monograph for extractum nucis vomicæ calcium phosphate is used as a diluent instead of milk sugar; the opinion is expressed that the present standard of 5 per cent. of strychnine should be adhered to, notwithstanding that the extract of nux vomica of the Brussels International Agreement is standardised to contain 16 per cent. of total alkaloids, the committee's reason for the divergence from the International Agreement being that standardisation in terms of strychnine is considered essential, inasmuch as the toxicity of the drug is almost entirely due to this alkaloid, and the proportion of it in the total alkaloid varies within somewhat wide limits. New monographs are suggested for extractum nucis vomicæ liquidum and extractum opii, but the alkaloidal strengths of the two preparations remain unaltered. An improved process is submitted for the manufacture of extractum sarcæ liquidum and in the preparation of extractum taraxaci liquidum percolation with 30 per cent. alcohol is suggested, as by this means an extract is produced which keeps better than that made by the process at present official. A new method is recommended for the manufacture of ferri carbonas saccharatus which yields a product containing more ferrous carbonate and keeps better. The limit of arsenic in ferri sulphas is fixed at 1 part per 1,000,000 and in ferri sulphas exsiccatus 2 parts per 1,000,000. Ferrum redactum should be required to contain not less than 80 per cent. of metallic iron instead of 75 per cent. as at present; arsenic should not be present in greater proportion than 200 parts per 1,000,000. An extended description of filix mas is suggested in order to render its identification more precise, and the description of fœniculi fructus is modified so as to include the varieties rich in volatile oil and fenchone, and exclude those that are poor. The requirements of gentianæ radix are made more stringent so as to prevent sophistication as far as possible. A new monograph for glycerinum is submitted which allows of the presence of not more than 2 parts per 1,000,000 of arsenic. In the formula for glycerinum acidi borici, boric acid in crystals is substituted for fine powder, as the former gives a clearer solution. A new formula is suggested for glycerinum plumbi subacetatis and also an improved description of glycyrrhizæ radix, which requires the root to be dried. Hydrargyri iodidum rubrum is required to contain at least 98·7 per cent. of mercuric iodide, and it is suggested that the name hydrargyri oleas should be altered to "hydrargyrum oleinatum." The solubility test of hydrargyri perchloridum is altered to 1 in 18 of water (instead of 1 in 16) and 1 in 4 of alcohol (instead of 1 in 3). A test showing the absence of more than traces of mercuric chloride is introduced in the monograph on hydrargyri subchloridum. It is suggested that foreign-grown biennial henbane should not be excluded. Iodum should be required to contain at least 99 per cent. of pure iodine. Fuller characters and tests for ipecacuanhæ radix are submitted, and the resin yield of jalapa is reduced from "not less than 9 or more than 11" to "not less than 7 or more than 9 per cent." The percentage of jalapæ resina soluble in ether is raised from 10 to 15. It is suggested that kino should be heated to boiling before evaporation to dryness. A basis for lamellæ is suggested for inclusion in the appendix, with which to prepare discs of atropine, cocaine, homatropine, and physostigmine. It is suggested that linimentum aconiti should be made from a liquid extract standardised to contain 0·4 per cent. of alkaloid, and that the tincture of aconite should also be prepared by diluting the liquid extract so as to contain 0·05 per cent., the strength adopted by the international agreement. It is proposed to prepare liquor arsenicalis without the use of potassium carbonate in order that the dangerous incompatibility of this solution with solutions of alkaloidal salts may be avoided. As liquor atropinæ sulphatis is used for dropping into the eye the committee suggest that it should be freshly prepared without salicylic acid. It is proposed that the name liquor iodi fortis should be altered to "pigmentum iodi," that the name liquor magnesii carbonatis should be altered to "liquor magnesii bicarbonatis," and that under glucosum a monograph for liquid glucose should be introduced. It is expected that the final report of the committee will be ready by May next year.

THE COLD AND SHOWERY WEATHER OF LAST WEEK.

AFTER a generally dry and warm fortnight or so the weather broke up on the 22nd or 23rd of last month with violent thunderstorms, after which it was extremely showery, often dull, and unseasonably cold. The table below shows the temperature, sunshine, and rainfall of last week for a few scattered localities which may be taken to represent fairly well the whole of Great Britain. When compared with the average the temperature readings might be almost called abnormally low for the time of year. In London, for

instance, the average maximum is above 71° or about 8° higher than that of last week, while at Bath and Nottingham the divergence was almost as striking, and although the difference from the normal was not so great at the stations further north it was very appreciable. The temperature of the nights was also low for the season. The departure from the normal, however, was much less marked at night than during the day; in many places it was only about 2°. In many parts of the kingdom the showers were very frequent, and as the intervals between were not always accompanied by a clear sky the total duration of sunshine was generally very small. In London and some other places there were only 28 hours, an average of four hours per day, a considerable proportion of which was recorded before the world was awake, and at Manchester the figure was no more than 13 hours. Several spots along the south and east coasts, and a few inland, such as Bath, were more fortunate, but over the kingdom generally the sunshine was very meagre for the time of year.

—	Mean maximum temperature.	Mean minimum temperature.	Mean temperature for week.	Number of hours of sunshine.	Days with rain.	Total fall in week.
	°	°	°	Hours	*	Inches.
London (Westminster) ...	63·4	50·9	57·2	28	6	0·99
Bournemouth	63·6	52·4	58·0	50	4	0·60
Margate	63·7	51·9	57·8	28	4	1·49
Bath	62·3	50·7	56·5	58	6	0·81
Nottingham	62·0	49·0	55·5	27	6	0·89
Harrogate	58·6	48·6	53·6	33	4	1·12
Liverpool	58·7	49·6	54·2	28	7	1·23
Manchester	58·6	50·6	54·6	13	6	1·75
Aberdeen	57·7	46·1	51·9	20	7	0·72

* Days with at least 0·01 inch.

THE NERVES OF A TELEPHONE OPERATOR.

THERE have recently been public allusions made to the prevalence of nervous breakdown among telephone operators, and, whether the prevalence be exaggerated or not, it is certainly a fact that the public scarcely realises the excessively trying nature of the work which the telephone exchange operators perform. At present the everyday attitude to the officials at the exchanges can scarcely be called a long-suffering one. A man goes to the telephone, takes up the receiver, and rings up the exchange; if the response is not prompt he is annoyed and shows it; if, on having given the number he requires, an immediate answer is not forthcoming he is again annoyed and again shows it; and when he is put on to a wrong number—but there is no need to tell the full story of a sad loss of self-control. Everyone is not so unreasonable, but it seems that an appreciable portion of the public believe that the operators make mistakes out of pure and unalloyed wickedness, aimed either against the mass of the subscribers in general or against the individual sufferer. We would urge, even while we admit that the number of stupid mistakes made by telephone operators does appear large, that some thought should be given to the fact that the operators are not mechanical contrivances, and that any individual operator with whom we get into communication is, himself or herself, part of a great and complicated scheme any failure in which may often be felt at a distance from its cause. It is silly and unjust to conclude if any hitch should occur that the particular exchange operator who is then in communication must be the delinquent—the deliberate and frigid delinquent. And although the exhibitions of temper which too many of the public allow themselves to manifest may be received with apparent equanimity by the operator, we cannot doubt that they must have a wearing effect. For life at the telephone exchanges is neither a quiet nor a pleasant one. The work is trying and puts a constant strain on the attention, while rigid self-control is asked for in anyone who during long business hours has to enter upon incessant dialogues with a public that is generally in a hurry. Recently, Mr. H. Samuel, in answer to a question in the House, stated that in view of the large number of cases of hysteria and other nervous troubles reported amongst the operators, an investigation had been instituted. He added that the results of this investigation were receiving careful consideration. We hope that the publicity which has been given to the matter may do something towards ameliorating the attitude of the public to the telephone operators, and may help the public to remember that these operators are human beings and not machines.

FOREIGN MEDICAL PRACTITIONERS IN ITALY.

THE General Medical Council has received from the Privy Council copy of a despatch from His Majesty's Ambassador at Rome, enclosing a report on recent legislation affecting the position of foreign medical practitioners in Italy. He states that under the new law British medical practitioners will in future, in virtue of the reciprocity granted by Great Britain, enjoy unrestricted freedom of practice in Italy, instead of the limited rights hitherto conceded them of practising only among foreigners. As matters now stand this concession only benefits British practitioners, Great Britain being the only country that grants reciprocity to Italy. This reciprocity was accorded in 1901 when on March 9th an Order in Council was issued putting in force the second part of the Medical Act of 1886.[1] Our Italian correspondent referred in detail to these changes in the letter from Italy published in THE LANCET of June 18th, p. 1724, and we refer our readers thereto for full information.

THE WORLD MISSIONARY CONFERENCE AND THE ABUSE OF OPIUM.

A GREAT English consultant of the nineteenth century pronounced opium and its pharmaceutical derivatives to be the "gift of God to man," and medical practice throughout Christendom has ratified his dictum. But, like alcohol and other powerful agents operating on the nerve centres, opium and morphia may become not a blessing but a curse, causing disease and death physically, and degeneration and disaster morally and socially, if indulged in without medical warrant and consumed habitually to excess. Evidence to this effect was brought before the recent World Missionary Conference by speaker after speaker, particularly by those whose evangelising work had lain in the far East, where, in China particularly, the consumption of opium had deepened and widened and intensified into a racial calamity, arresting all healthy evolution and proving a well-nigh insurmountable barrier to the nation's falling into line with the march of civilisation. The Chinese themselves have long been feelingly persuaded of this, and their organised attempts to reduce the opium habit, and finally to restrict its use to medical prescription, have for years been strenuously in operation. But, lamentable to admit, it is the "Christian civilisation" from whence proceeds the temptation, and the means, to contract and to continue the habit—the evidence of this adduced by the medical missionaries being simply appalling. From Edinburgh itself, the chosen seat of the World Conference, there was, according to Mr. D. D. Main of Hangchow, a brisk export

[1] See London Gazette of March 9th, 1901.

of pills, nominally designed to break the habit of opium-smoking, but by their composition, largely impregnated with morphia, only encouraging the habit under another name. The pills, said Mr. Main, "sent out and labelled as kegs of bicarbonate of soda," were a secret preparation; "no manufacturer would tell where they were exported to," and yet, he added, "most of the morphia that found its way to China had its place of origin in Edinburgh." Other speakers, to similar purport, followed, and the Rev. Dr. Griffiths, giving his experience of Assam, assured the Conference that the tribes in that country were, thanks to the indulgence, "in a state of disintegration." Young and old, men and women, even children of tender years, were slaves to it—mothers even selling their offspring, after their husbands had sold their cattle, for means to buy the drug! Difficulties no doubt—difficulties arising from commercial interests protected by treaty rights—confronted the movement to antagonise and ultimately to modify the opium traffic so as to restrict it to purely medical requirements, and the members of the conference were assured, on the authority of more than one political delegate, that responsible statesmen like Lord Morley and Sir Edward Grey were in full sympathy with the restrictive policy, and doing their best towards its consummation, in which they had no more sincere and energetic auxiliaries than the Chinese themselves. A resolution submitted at a meeting held in connexion with the Conference and carried *nemine contradicente*, urged "(1) that the opium traffic, morally indefensible, should, in response to China's heroic efforts, be ended much more speedily than the existing 10 years' arrangement contemplated; (2) that meanwhile China should be left free to control the import of opium as she finds best in her own interests; and (3) that the invitation from the United States to an International Conference be accepted by the British Government so that the principles embodied in the Shanghai Conference may be fully carried into effect." This resolution was declared by its mover, Mr. Theodore Taylor, M.P., to prelude a "crusade against the unauthorised (that is, the non-medical) use of all dangerous drugs," a crusade which would be strengthened by the new allies which, from no profession more largely than that of medicine, would be brought into the field.

EPIDEMIC POLIOMYELITIS.

IT is probably no exaggeration to state that acute poliomyelitis is endemic in London and the south of England. Fresh cases of the disease appear with unfailing regularity at the out-patient departments of our hospitals all through the summer months, and, indeed, during other seasons of the year as well. But acute poliomyelitis in epidemic form is practically unknown in this country. The same was true of Germany till last year, when the first real epidemic of the disease ever recorded in that country began to rage in the district of Rhenish Westphalia. It has consisted of hundreds of cases, moderately severe, and it has been especially noteworthy for the occurrence of gastro-intestinal symptoms. The curious fact that epidemics of poliomyelitis have followed outbreaks of cerebro-spinal meningitis in various parts of the globe (this has been the case in the German epidemic referred to above) is suggestive when we remember the recent epidemics of the latter disease in Scotland and Ireland, as well as in England. The epidemic of acute poliomyelitis in Greater New York in the summer and autumn of 1907 was the first to be reported in any of the larger American cities, when at least 2500 cases occurred. Recognising the importance of the subject, the New York Neurological Society appointed a Committee of Investigation in October, 1907. The New York Academy of Medicine and the Department of Health of New York City at once gave their coöperation, and the Rockefeller Institute of Medical Research also lent its active support to the work of the committee. Under these happy auspices the labours of the Collective Investigation Committee have been most productive, if we are to judge by the report[1] which has just been published. To put briefly the more important of their conclusions, it may be said that epidemic poliomyelitis differs widely from the old-time conception of infantile spinal paralysis; that it is an infectious, if not a contagious, disease, which may involve the lower portion of the brain-stem as well as the spinal cord; that it behaves like other acute infectious diseases of childhood; that in some instances the general symptoms of infection are as prominent as are the symptoms of paralysis; that it is a more fatal disease than was supposed, and yet recoveries are more common than was suspected; that meningeal symptoms are unusually common in the earlier stages of the disease; and that epidemic polioencephalomyelitis occurs, though rarely. The disease can be transmitted from man to animals through several generations, and some light has already been thrown on the properties of the virus of epidemic poliomyelitis. As regards the epidemiology of the disease, the epidemic began in June and reached its height in September. The "date of onset" curve is very similar to that given by Wickman for the cases in the epidemic in Sweden in 1905, except that the latter reached its height in August. The disease spread rapidly along ordinary lines of communication into the surrounding country, appearing more particularly in the state of Massachusetts. The fact that of 750 cases reported only two occurred in negro children is remarkable. While the disease was moderately communicable, about as much so as epidemic cerebro-spinal meningitis, the path of infection could not be determined, although some evidence pointed to the upper respiratory tract as being the route of invasion. In the epidemic there were 18 houses each with two cases, and five houses each with three cases. The estimated mortality was 5 per cent., which is low, as far as epidemics go; in other words, the infection was of a mild type. Evidence points to an incubation period of less than ten days. Among the symptoms preceding the onset of the paralysis, fever, restlessness, and vomiting were common; rigidity of the neck was remarkably frequent, pain and tenderness almost universal. Sometimes the pain was excruciating. It was commonest in the lower extremities, less frequent in the spine and trunk, and least common in the neck and arms. The well-known flaccid paralysis typical of poliomyelitis was reported in 632 patients, and yet *rigid* paralysis was distinctly recorded in 38 patients. This is to be regarded, no doubt, as a symptom of sensory irritation reflected in the motor neurons, and it may be due, also, to some meningeal involvement. All sorts of combinations of paralysis of face, arms, and legs were noted: the face is specifically referred to as having been paralysed in 27 cases; in 681 it was not affected. The left side of the body was more frequently affected than the right. In 47 per cent. of reported cases there was a marked regression of all symptoms except a residual paralysis, and in 5·3 per cent. a complete disappearance of all paralysis was noted. Much the most common residual palsy was in the peroneal, anterior tibial, calf, quadriceps, or deltoid group. Bulbar cases and cases closely resembling Landry's acute ascending paralysis occurred. The pathology of epidemic poliomyelitis has been recently referred to in THE LANCET.[2] The chapters in this report dealing with the subject are contributed by Dr.

[1] Epidemic Poliomyelitis: Report of the Collective Investigation Committee on the New York Epidemic of 1907. New York: Journal of Nervous and Mental Disease Publishing Company. 1910. Price $2. No. 6 of Nervous and Mental Disease Monograph Series.

[2] THE LANCET, Feb. 19th, 1910, p. 524.

Simon Flexner and Dr. Paul Lewis of the Rockefeller Institute and by Dr. Strauss of the Cornell Medical School. The evidence brought forward by these investigators is of the greatest value and importance. As was pointed out in a leading article in THE LANCET,[3] it is now certain that a disease similar to acute poliomyelitis in man can be produced by inoculation of the human cord into monkeys; in addition reinoculation from monkey to monkey is possible and may apparently be kept up indefinitely. Histologically the lesions in poliomyelitis are very like those in human rabies. Moreover, the manner in which the monkey is infected is identical with the route of infection used in the production of experimental rabies. Further, there occurs a type of ascending paralysis in rabies which is clinically identical with that of acute poliomyelitis. These facts point to a possible analogy between the infective agents in both conditions and to a possible means of immunisation.

GRAIN ITCH.

Dr. J. F. Schamberg of Philadelphia has recently published an account of a disease which has appeared in Philadelphia and its neighbourhood. Late in the spring of 1901 there appeared in Philadelphia and the surrounding country an eruptive disorder which was entirely new to the physicians of that district. Every year it has recurred, usually in the month of May and the beginning of October, and it was especially widespread in 1909. Public attention was drawn to the disease by an outbreak occurring among 20 sailors upon a private yacht docked in the Delaware river, and the disease was investigated by Dr. J. Goldberger and Dr. Schamberg. The conditions obtaining on the yacht were thoroughly examined, and it was discovered that a number of new straw mattresses had recently been received on board and that the disease was confined to those who had slept upon the mattresses or had placed their clothes upon them. Information was also obtained that a similar eruptive disease prevailed on four other boats on the Delaware river, and investigation showed that these boats had also received new straw mattresses, and further that only those were attacked who had slept upon the mattresses or had otherwise come in contact with them. In addition to these cases some 70 other instances of this disease occurring in 20 different households in Philadelphia and in its neighbourhood were investigated, and in almost every instance it was found that the patient had either recently slept upon a new straw mattress or had freely handled one. All the incriminating mattresses were supplied by four mattress makers, and it was discovered that all the manufacturers had made them up from wheat straws supplied by one dealer. When the straw from the mattress was carefully sifted through a fine flour sieve it was seen that some slight movement was occurring in the siftings, and the microscope showed the presence of a very minute mite which was identified as the pediculoides ventricosus. Dr. Goldberger exposed his arm to the straw of the mattress for an hour, and 16 hours later characteristic lesions appeared, and the siftings had a similar effect upon some other volunteers. The disease was characterised by an eruption consisting of wheals, many of which were crowned with minute vesicles. In a few hours the vesicles became pustular. The extent of the eruption varied greatly in different subjects. Usually it was profuse, especially on the neck, chest, abdomen, and back; the face, hands, and feet were nearly always exempt. The itching may be intense. During the early days of the attack the patient may feel cold, and in some cases nausea and even vomiting are present and mild rigors may occur. The temperature may reach 100° F. or even 102° F., or possibly higher, and this pyrexia may last for several days; on the other hand, it may be entirely absent. There appears to be not the faintest doubt that the disease is due to the acarus mentioned above. Wheat straw is liable to give rise to the disease, but the straw of barley and other grains may also be contaminated with the acarus. The pediculoides has an economic importance because it tends to protect the grain crops by destroying the larvæ of several insects which prey upon grain. A similar affection has been described many years ago in France, Germany, and Russia. As to the treatment, it seems to be fairly easy to destroy the acarus, and Dr. Schamberg recommends especially an ointment containing 30 grains of beta naphthol and 40 grains of precipitated sulphur to the ounce of benzoated lard. It will be of interest to know if any cases of this disease have been seen in this country.

[3] THE LANCET, Feb. 19th, 1910, p. 512.

BLEACHED FLOUR.

WE are glad to note that a question was put to the President of the Local Government Board in the House of Commons last week in regard to the bleaching of flour with nitrous acid. Mr. Burns replied that he had already directed an investigation into the matter by one of the inspectors of the Foods Department of the Local Government Board. We are sure that Mr. Burns will be interested to know how legislation has been brought to bear upon the subject in the United States, according to an account recently sent to us by our own correspondent. In regard to a certain consignment of flour bleached by a well-known process depending upon the production of nitrous and nitric acids from the air by electric sparking, the United States Government held that the flour contained poisonous and deleterious ingredients—namely, the nitrites produced during the process The flour was condemned and ordered to be forfeited. The evidence of well-known authorities on dietetics, chemistry, and physiology was unanimous in condemning the practice. Dr. Gustav Mann stated that there is always a distinct change induced in the starch as a result of bleaching. From actual experiments he found that the bleached flour was digested to only one-third the extent of the unbleached. The injurious action of the nitrous acid developed in the stomach from the nitrites would be proportional to the amount of nitrites present in the flour. Thus, two molecules would put out of action two molecules of hæmoglobin or two of nucleoprotein and would inactivate two molecules of any ferment (enzyme) that might be present. The bleaching of flour not only causes a loss in food value, but renders digestion of the food made from it 20 to 75 per cent. more difficult. As regards the effects of the nitrous acid on the human body, there is danger that a dose which under ordinary conditions is normal might cause death in feeble individuals. Dr. Mann concluded that the bleaching of flour should not be permitted. Dr. Hamilton P. Jones said that the use of nitrogen peroxide in bleaching flour would tend to impair the digestibility of the bread and produce gastric irritation. Dr. John Marshall gave evidence that the general effect of the addition of nitrites to food made from wheat flour is to endanger the health of the consumer. Confirmatory evidence was given by Dr. John H. Musser, Dr. David L. Edsall, Dr. Otto Folin, Dr. Augustus H. Gill, and others. In the absence of authoritative statements rebutting this overwhelming array of evidence against the use of flour bleached with nitrogen peroxide, it would seem that the health of the people demands the abandonment of the process. The slightly creamy colour of unbleached flour is certainly more appetising than the bluish-whiteness of bleached flour, and the loss of odour and taste as a result of bleaching are sufficient objections to the process, even without taking into consideration the probable deleterious action of the nitrites on the system.

THE King has been pleased to become Patron of King Edward's Hospital Fund for London. His Majesty has, on the recommendation of the Lord Chancellor, the Prime Minister, and the Governor of the Bank of England, in accordance with the Act of Parliament, appointed as Governors of King Edward's Hospital Fund for London the following: H.S.H. the Duke of Teck, G.C.V.O., the Viscount Iveagh, K.P., and the Speaker of the House of Commons.

His Majesty has appointed His Serene Highness Prince Alexander of Teck to be Grand President of the League of Mercy, and Her Royal Highness Princess Alexander of Teck to be Lady Grand President of the League. His Majesty now becomes Patron of the League and Sovereign of the Order, and has intimated the continuance of his personal interest in its welfare.

THE annual meeting of the Association for the Oral Instruction of the Deaf and Dumb (11, Fitzroy-square, W.) will be held at the Portman Rooms, Baker-street, W., on Thursday next, July 14th, at 4 P.M., when a short illustration of the system will be given.

No meeting of the Obstetrical and Gynæcological Section of the Royal Society of Medicine will be held during July.

THE Education Committee of the London County Council on July 6th unanimously decided to ask the Home Secretary to receive a deputation whose object should be to urge the need for legislation to enable provision to be made for the care of sane epileptics on the lines recommended by the Royal Commission on the Feeble-minded.

INTERNATIONAL CONGRESS OF RADIOLOGY AND ELECTRICITY.—An International Congress of Radiology and Electricity will be held at Brussels on Sept. 15th, 16th, and 17th, which promises to be well attended and the proceedings of more than ordinary interest. A perusal of the programme shows that the physical side of the subjects included in the scope of the congress will receive a share of attention seldom attempted before, and the number of scientists whose work in this field has been of the greatest value that are taking an active part is quite remarkable. We may mention among others a paper by Sir J. J. Thomson on Positive Electricity; one by Professor Rutherford on The Radium Emanation. Turning to the medical section, we notice papers are promised by Dr. Haenisch and Dr. Köhler from Germany, from Dr. Béclère, Dr. Belot, Dr. Dominici, and Dr. Wickham from France, and Mr. C. Thurstan Holland and Dr. E. Reginald Morton from Great Britain. Further contributions are invited, and those wishing to participate should write to Professor E. Rutherford (President of the Committee for Great Britain and Ireland), Physical Laboratory, the University, Manchester, regarding communications for the physical sections, and for those relating to the biological and medical sections they should put themselves into communication with Mr. W. Deane Butcher (one of the secretaries of the committee), Holyrood, Ealing, W. The other secretary is Dr. W. Makower, University of Manchester. Intending members should, however, communicate directly with the general secretary, Dr. J. Daniel, 1, rue de la Prévôté, Brussels. It is of interest to note that the Brussels Exhibition will still be in progress, and that members of the Congress will be accorded free access to the exhibition on production of their membership card. The work of the Congress will be organised in three sections, the first dealing with terminology and radiometry, the second with physical science, and the third with biological sciences, with a sub-section for medical radiology. The following English scientists are members of the general committee: Sir W. Crookes, Sir W. Huggins, Sir O. Lodge, Sir W. Ramsay, Lord Rayleigh, and Professor Rutherford Schuster. We published a list of the presidents of the committees in each country in THE LANCET of Nov. 13th, 1909, p. 1449.

THE CONFERENCE AT EDINBURGH ON THE PREVENTION OF TUBERCULOSIS.

Annual Meeting of the National Association for the Prevention of Consumption and Other Forms of Tuberculosis.

(FROM OUR SPECIAL SANITARY COMMISSIONER.)

Edinburgh, July 3rd.

THIS Conference forms a new departure, for the annual meetings of the National Association for the Prevention of Tuberculosis have hitherto been held in London. It was felt, however, that the work of propagandism would best be served by visiting different towns, a practice observed by most other congresses and conferences which depend on public support for ultimate success. In selecting such a place of meeting Edinburgh was naturally preferred, as the Edinburgh antituberculosis scheme is not only the most complete in theory, but, with the inauguration of the Royal Victoria Hospital Farm Colony at Springfield, which took place on Saturday, July 2nd, it may also be said to be complete in all the important details of practical application. Therefore the Conference meets at Edinburgh to celebrate this happy event and, incidentally, to congratulate its chief promoter, Dr. R. W. Philip. But before the actual business of the Conference was commenced a sort of skirmishing line was thrown forward to prepare the way and to awaken public attention. The real discussions were announced to begin on Monday, July 4th, but the tuberculosis exhibition was opened on Friday, the 1st, and several lectures were delivered on Saturday morning, the 2nd. Then 600 invitations were issued to assist at the inauguration of the Farm Colony in the afternoon. Even the Sunday was utilised by holding a semi-religious meeting of University students who listened to an address from Professor Osler, Regius professor of medicine at the University of Oxford, on "Man's Redemption of Man."

The Annual Meeting of the Royal Hospital for Consumption, Edinburgh.

The Exhibition and the Conference are being held at Rainy Hall, where the annual meeting of the Royal Victoria Hospital for Consumption, Edinburgh, took place on Friday afternoon, under the presidency of Lord Provost BROWN, who congratulated Dr. Philip on the practically completed scheme for the treatment of tuberculosis in connexion with the Royal Victoria Hospital—a scheme upon which Dr. Philip had set his heart.

Opening of the Tuberculosis Exhibition.

After the meeting Her Excellency the Countess of ABERDEEN opened this exhibition, an honour which her ladyship supposed had been conferred on her because she had experience of the good done by similar exhibitions in Ireland. She, too, congratulated Dr. Philip and also his colleagues on the fruit of their labours during 20 years in combating tuberculosis. The first tuberculosis exhibition, she said, was held at the Dublin International Exhibition in 1907. Subsequently this show was divided into two exhibitions, one going north and the other south, and thus tuberculosis exhibitions were held in 80 different districts of Ireland. Not content with this, the Women's National Health Association of Ireland, under the guidance of their medical friends, had started travellings vans, and these had visited 223 places in Ireland, giving popular lectures and explaining how best to ward off the danger of tuberculosis. They were very proud indeed when they heard that at the Tuberculosis Congress in New York they had been awarded a prize of $1000 for the most effective work done by any voluntary association in the world. One of the results was that they had open windows all over Ireland now and the death-rate from tuberculosis had already fallen substantially. After Lady Aberdeen had declared the exhibition open, Sir ALEXANDER CHRISTISON and Sheriff CRAWFORD proposed the usual votes of thanks.

It is unnecessary to describe in detail the exhibition, which is similar to those which have been held in various parts of the country, and which have been from time to time

described in the columns of THE LANCET. The many interesting object-lessons with regard to the benefits to be derived from fresh air attracted a large number of visitors, the models and photographs of sanitary and insanitary buildings, the exhibits in connexion with milk-supply, and French gardening for consumptive patients creating great interest. The large sanatoriums were, of course, well represented. An exhibit which appealed to the more educated section of the visitors was a picture of a health temple in Greece *circ.* 400 B.C., and a work by Galen, in which that celebrated physician recommends milk mixed with honey and the Egyptian climate as remedial measures. The pathological section, though not attracting so many visitors, no doubt served a useful purpose.

Professor E. J. McWeeney on the Prevention of Tuberculosis.

On Friday evening the first of the series of popular lectures was delivered by Professor MCWEENEY of Dublin at the New College Buildings. He first insisted on the debt we all owed to Villemin, who in 1865 proved that tuberculosis was infectious, and secondly to the late Robert Koch, who discovered the micro-organism of infection. He compared tubercles to the bites of insects which deposited their eggs in plants and produced the swellings called "galls," and explained how easily the disease was spread by careless people. While recognising that there was a difference of opinion, he thought children ran a great risk when they drank milk from cows with tuberculous udders. Such cows should be eliminated from the milk-supply. Professor McWeeney concluded by insisting on the necessity of popular education on these prophylactic questions.

"Tuberculosis Morning" in the Edinburgh Schools.

On the Saturday morning no less than six lectures were delivered in six different schools for the purpose of teaching both teachers and pupils what all should know in regard to tuberculosis. Thus, at the Broughton School, Professor MCWEENEY held forth once again, explaining in simple language the etiology and development of the disease and insisting that it was quite as much a social as a medical problem.

At the Boroughmuir Higher Grade School Dr. Arthur Latham was announced to lecture; but, being detained, was replaced by the Countess of ABERDEEN, who insisted on the virtues of deep breathing, oatmeal porridge, and tooth-brushes, and advocated a crusade against flies. On all sides we were to proclaim that consumption was preventable, and it was the duty of thinking persons to take a full part in every international effort to banish the disease from the world.

Professor G. SIMS WOODHEAD at the Royal High School pointed out that the prevalence of tuberculosis had already been reduced by one half. It was a disease of poverty, bad housing, bad feeding, bad air, dirt, and certain dangerous trades. Of the latter, those who worked in public-houses suffered the most, but a medical man could not alter the customs and constitution of a public-house. The chairman of the public health committee of Edinburgh could do far more than the members of the medical profession. If in 50 years tuberculosis had been reduced by half there was no reason why, if the public supported the profession, the disease should not be eradicated altogether in another 50 years. For this it was necessary to spend some money, as special schools, special hospitals, and the money to take the sufferers away from their work were required. Great social reforms were costly.

Dr. A. CHARLES GRAY lectured at the Drummond-street School, and having proclaimed himself an Edinburgh man congratulated his own city on having the most complete plan for dealing with consumption of any town in the world. In London in one year more people died from tuberculosis than were killed during the whole of the South African war. In dealing with the whole question at issue Dr. Gray made a special point of denouncing the disgusting and dangerous habit of spitting in the streets and public places.

At the Bruntsfield School Dr. J. E. SQUIRE gave in a popular manner an account of the origin and treatment of the disease, saying that if medical advice was obeyed the disease could be stamped out in a generation. He described the attack by the germs upon the body cells, and said that the cells, to repel them, must be kept in sound health by proper food, fresh air, exercise, and cleanliness; then the cells would be able to defeat and to destroy the invading germs of tuberculosis. It was also necessary to know where these germs originated so as to reduce the frequency of such invasions. In answer to a question, Dr. Squire said it was not necessary to exclude children with swollen glands from school if there was no discharge.

Dr. JANE WALKER spoke at the Flora Stevenson School, addressing an audience of girls and boys. Mr. CUNNINGHAM, a member of the school board, presided, and explained that sanitation and health questions were taught in all the schools, though he readily recognised that such teaching was as yet inadequate. Dr. Walker, among other matters, insisted on the necessity of good cooking and good teeth. Dirt, darkness, dust, and drunkenness were the foes which, in common with the other speakers, the lecturer energetically denounced.

Thus, commencing with six of the principal schools of Edinburgh, has the work of popular education begun. Such instruction is one of the chief objects of the Conference, and it will be seen that it has been pursued with energy before the Conference commenced its official sittings.

Inauguration of the Royal Victoria Hospital Farm Colony at Springfield.

On the afternoon of Saturday two special and closely packed trains took many hundred people to the station of Polton, about half an hour's ride from Edinburgh. Here we slowly ascended a wooded hill well away from town and smoke. At the summit there was a delightful manor house, and on the luxuriant grass of the lawn several tents were pitched, the largest of which was to serve for the inaugural meeting of the supporters of the Royal Victoria Hospital Farm Colony; the others served the needs of the guests of the hospital at a garden party. Sir ALEXANDER CHRISTISON presided over the meeting, and Sir GEORGE M'CRAE spoke on behalf of the Scotch Local Government Board. He gave a short history of what had been done, how Dr. Philip began first by establishing his base, which was the Lauriston Dispensary. Then came the hospital and sanatorium, great institutions for finding out the weak points in our social system. As a result of so many efforts the number of deaths from tuberculosis in Scotland had fallen from 6800 in 1906 to 5700 in 1909. In 1906 not a single Scotch municipality had established compulsory notification of tuberculosis, but at present notification was obligatory for practically half the population of Scotland. Sir George M'Crae was warm in his congratulations of Dr. Philip and those who had been associated with him in his great work. The results were likely, he thought, to prove stupendous—it was not possible to apply a limit to them.

The duty of declaring the farm colony open devolved upon Lady Dunedin, who explained that this was the first farm colony in Scotland and the finishing touch of the Edinburgh scheme for fighting tuberculosis. The complete work was an achievement for which no praise could be too warm. Lady Dunedin, after echoing the numerous congratulations to Dr. Philip, went on to say that much was also due to Miss Guy and her staff at the Victoria Hospital for their management of the patients. After a few more felicitous compliments she declared the Springfield Farm Colony open.

The object of this farm is to provide for patients from the Royal Victoria Hospital for Consumption an opportunity of going through a hardening process before they return to their usual life and occupations. The farm outdoor work is for those who are considered to be cured and is organised to prevent a relapse. The patients have gained weight at the hospital, now, in popular phrase, this has to be converted into muscle. The patients are set to work, but, unlike work under commercial conditions, they only work gradually, commencing with the lighter tasks. I need not, however, describe to medical readers the routine of graduated labour. Dr. Macpherson, who in is charge, sees that by working hope is encouraged but that none work too hard. The general verdict is that the patients work better and more willingly than the ordinary paid labourer. The farm overlooks the valley of the river Esk. There is beautiful scenery on all sides and much fine timber. It is situated 280 feet above the sea level and has a most productive soil. The farm has 50 acres of land where all sorts of vegetables and fruit can be grown, and these are

supplied to the Victoria Hospital, so that the patients who are ill eat the vegetables grown by the patients who have been cured. Then, poultry are kept here and the patients will thus not depend on the trade for fresh eggs. They will have their own bacon also, for there is to be a piggery. Though only just formally inaugurated, there have been patients on the farm since last February, so that it is already possible to see how well the scheme works. Certainly the many hundred visitors who assisted at the inauguration ceremony were highly gratified by what they saw, and fortunately the beauty of the scenery, the fine old trees, and numerous flowers were illuminated by the rare advantage of a little sunshine.

MONDAY, JULY 4TH.

The Conference commenced its work in real earnest this morning at 10 o'clock, but the method of procedure adopted is one that does not, in the opinion of many thoughtful persons, make for the progress of science very quickly. The real advantage of conferences should be that subjects can be thoughtfully and thoroughly discussed. The idea probably was that a paper upon some aspect of the prevention of tuberculosis should be read to introduce the subject and then discussion would follow. Thus this morning Dr. Sims Woodhead opened the discussion on the Avenues of Infection. He spoke to a large extent extemporarily, and discussion might advantageously have ensued. But other authorities had written out papers, and it was felt that the taking of so much trouble merited the reward of a hearing. Thereupon first one paper and then another, all of which certainly dealt with the question at issue, were read; but the papers had no definite connexion or sequence, and when they had all been read there remained in the morning but a few minutes for discussion. At the afternoon sitting the position was worse still, for the papers could not be read in the allotted time, and though the meeting was prolonged beyond the hour fixed for closure, still there was no time for discussion, and any attempt to hold a debate before the much attenuated audience at such a late hour would have been quite futile. Dr. Hermann M. Biggs of New York opened what should have been a discussion on the Preventive Measures and the Administrative Controls of Tuberculosis by describing what had been done in New York. But the foreign delegates who attended the International Congress on Tuberculosis held at Washington in 1908 heard and saw a good deal of this work, and many then declared that but few European countries could tolerate such autocratic modes of procedure. The patients were isolated by force, while rigour was shown towards the speculators who built the "death traps" or "death block" where 360,000 rooms have no windows giving on to the outer air. These are serious matters and the light of discussion was much needed. Again the death-rate from tuberculosis has been reduced in New York, but a large part of the population is composed of newly arrived immigrants and no one with the slightest trace of tuberculosis is allowed to land in America. In no other part of the world is the population thus specially selected. These are points with which Dr. Hermann M. Biggs is thoroughly familiar and could have handled to the confusion probably of his critics had there been time to put questions and to elicit discussion. On the other hand, all the papers that were read were interesting and instructive, and I hope to describe those of them in detail for which the necessary space for publishing at length cannot be found, when the meetings of the conference are concluded.

The principal papers on Monday were the Administrative Control of Pulmonary Phthisis, by Dr. W. Leslie Mackenzie, member of the Local Government Board of Scotland; Dr. Hermann Biggs's and Professor Sims Woodhead's paper, to which I have alluded; Pulmonary Tuberculosis as a Problem of Administration, by Dr. A. K. Chalmers, medical officer of health of Glasgow; Preventive Measures and Administrative Control, two papers with the same object, by Dr. E. W. Hope, medical officer of health of Liverpool, and Dr. H. Scurfield, medical officer of health of Sheffield.

TUESDAY, JULY 5TH.

The second day of the Conference proper proved more interesting and more practically successful than the first day. There was more time for discussion and at least one important decision was arrived at.

The Frequency of Tuberculosis in Childhood.

Priv. Doz. Dr. FRANZ HAMBURGER (Vienna) was the author of the following address in opening a discussion on the Incidence of Tuberculosis in Childhood, in the morning, the paper being read by Dr. Philip. Dr. Hamburger wrote:—In conjunction with R. Monti I have endeavoured by extensive investigation to determine the incidence of tuberculosis among the children of Vienna. We adopted the method of examining only children who were suffering from acute infectious diseases (scarlet fever and diphtheria). In this way we obtained material which represented fairly accurately the real state of child life in Vienna. All the children were first tested by Pirquet's cutaneous reaction. Those reacting negatively were, after two days, subjected to a subcutaneous tuberculin injection of 1 milligramme. Those of the children who showed a distinct inflammatory reaction at the injection point of at least three days' duration were looked upon as tuberculous, as well as those showing a positive reaction. Monti and I found that out of 532 patients suffering from diphtheria or scarlet fever 271 reacted positively—that is, about 50 per cent.

Out of	23	children	in the	1st	year	0	reacted =	0 per cent.
,,	46	,,	,,	2nd	,,	4	,, =	9 ,,
,,	56	,,	,,	3rd	,,	11	,, =	20 ,,
,,	75	,,	,,	4th	,,	24	,, =	32 ,,
,,	50	,,	,,	5th	,,	26	,, =	52 ,,
,,	63	,,	,,	6th	,,	32	,, =	51 ,,
,,	46	,,	,,	7th	,,	28	,, =	61 ,,
,,	30	,,	,,	8th	,,	22	,, =	73 ,,
,,	35	,,	,,	9th	,,	25	,, =	71 ,,
,,	26	,,	,,	10th	,,	22	,, =	85 ,,
,,	29	,,	,,	11th	,,	27	,, =	93 ,,
,,	19	,,	,,	12th	,,	18	,, =	96 ,,
,,	17	,,	,,	13th	,,	16	,, =	94 ,,
,,	17	,,	,,	14th	,,	16	,, =	94 ,,

These results show how the frequency of tuberculosis in childhood increases from year to year.[1] When childhood is divided into six periods the following percentages with regard to the frequency of the disease are obtained: (1) First year,[2] 2 per cent.; (2) second year, 9 per cent.; (3) third to fourth year, 27 per cent.; (4) fifth to sixth year, 51 per cent.; (5) seventh to tenth year, 71 per cent.; and (6) eleventh to fourteenth year, 94 per cent. It follows that nearly all persons in Vienna of over 14 years of age are already "tuberculous"! This fact appears extraordinary and almost incredible. It is only appreciated when we investigate the fact further, and consider that tuberculosis in childhood is a relatively *harmless* disease. The tuberculosis runs its course commonly without giving any symptoms of disease. This explains the fact why so many children give a positive tuberculin reaction without at the same time developing any stronger symptoms of disease. It can even be said that the majority of children who are only affected by tuberculosis after the fifth or sixth year show no signs, or at least very few signs, of disease. This is the result of the constant increase of the frequency of tuberculosis on the one hand and the decrease of the tuberculous morbidity with increasing age on the other. This is further demonstrated by Pollak's clinical observations. It must be fully understood that tuberculous infection and tuberculous morbidity are two conceptions which it is difficult to separate. While in the first and also in the second year the majority of children infected with tuberculosis give also clinical manifestations of disease, older children overcome the primary tuberculous infection, the more probably the older they are at the time of the infection, without giving stronger symptoms of disease. The prognosis of tuberculosis developed in the several years becomes better from year to year. According to an approximate calculation the mortality from fresh tuberculosis in the several periods is as follows: (1) First year, 70 per cent.; (2) second year, 10 per cent.; (3) third to fourth year, 7 per cent.; (4) fifth to sixth year, 2 per cent.; (5) seventh to tenth year, 2 per cent.; and (6) eleventh to fourteenth year, 1 per cent. It is therefore clear that tuberculous morbidity decreases from year to year, although the incidence of tuberculous infection increases from year to year. The statistics regarding the incidence of tuberculosis among the children of Vienna by means of tuberculin reaction are confirmed by post-mortem results in recent years. Since the necropsy of children of over 6 years has been made with special attention

[1] The percentage for the first year is not reliable because the number of children examined (23) is too small. The real incidence of tuberculosis in this age, according to Sperk, is about 2 per cent.

[2] Corrected figure according to Sperk.

to the probable existence of a tuberculous focus, an almost equally great frequency of tuberculosis in Vienna has been determined by necropsy as by the tuberculin test on the living patient. If in former years the statistics obtained by necropsy as to the incidence were much lower, this is explained by the fact that the examination was not sufficiently searching. It must be specially emphasised that the figures obtained by Monti and myself refer only to the poorer population of Vienna. Probably in the wealthier population a much lower percentage of positive tuberculin reaction would be obtained than is the case in the poorer classes. In the case of the well-to-do, open pulmonary tuberculosis—the only source of tuberculosis in childhood—is not only much more rare than in the case of the poor, but the wealthy protect themselves much more carefully from every infection. The question now is whether the figures obtained by Monti and myself in Vienna are applicable to other towns as well. I think they are. If Ganghofer obtained lower figures in Prague than Monti and myself in Vienna, this is explained by the fact that the cutaneous reaction does not reveal all tuberculosis. The "Stich" reaction—that is, the local subcutaneous reaction—must also be employed if every case of tuberculosis is to be detected. That the frequency of tuberculosis is approximately as great in other large towns as in Vienna is supported by a recent publication by Nothmann, who gives almost the same figures for Düsseldorf as Monti and myself for Vienna. One can assume the same figures with regard to the incidence of tuberculosis in childhood in all the larger towns as I now present in regard to Vienna. In the country the incidence is probably rather less, and above all, more irregular, than in the town. Since the majority of persons develop tuberculosis already in childhood we cannot be surprised that tuberculous symptoms are so common in childhood. Indeed, tuberculosis in children usually offers very different symptoms from those of adults. In conclusion, let it be stated that tuberculosis very commonly is latent without any symptoms of disease. Especially is this so if the infection dates from the third to fourth year. Conclusions: 1. The majority of persons become infected by tuberculosis in childhood. 2. The frequency of tuberculous infection increases from year to year, while tuberculous morbidity—that is, the frequency of manifest tuberculous disease—decreases from year to year. 3. The prognosis of tuberculosis in childhood becomes more favourable the older the person is at the time of the first infection.

A debate followed on this paper, the discussion revealing the comparative frequency of abdominal tuberculosis among children. It appeared that this frequency was very marked in Edinburgh and Glasgow, but was dependent upon bad milk-supply and not bad air, as cases were cited where town-bred children had derived tuberculosis while in the country from drinking tainted milk warm from the cow.

The Working Man in Relation to Tuberculosis.

In the afternoon this subject was opened for discussion by Mr. C. H. Garland, who thought that neither the machinery of the Poor-law which failed in the direction of prevention, nor any insurance agencies as yet active, nor the existing voluntary organisations met the difficulties. He forecast State interference.

A resolution was then moved by Dr. CHALMERS to the effect that this council of the National Association for the Prevention of Tuberculosis, seeing the enormous cost of any effective action, should urge upon the Government the desirability of considering a general scheme of insurance against this disease. An amendment was brought forward by Dr. MCVAIL, not in opposition to the principle of State intervention or compulsory insurance, but against special legislature for tuberculosis. The amendment proposed to give a prominent place to the prevention of tuberculosis in the scheme actually promised by the Government of insurance against invalidity and unemployment. A considerable number of votes were given both in favour of the original motion and the amendment, but the latter was carried. The Conference was unanimous as to the issue, the only difference being whether the desired legislature should be part of a general scheme or a law dealing only with tuberculosis. Professor OSLER, in winding up the Conference, said that it had succeeded in its purpose, had awakened public attention, excited enthusiasm, while the attendance had been good.

So far as could be ascertained there were about 300 persons present at the meetings, consisting of members of the association against tuberculosis, of delegates from the public bodies, friendly societies, and other organisations interested in the question. The museum on tuberculosis remains open for the rest of the week and there are to be popular lectures every evening.

I understand that the Council of the Royal College of Physicians of Edinburgh has awarded the Victoria Jubilee Cullen Prize, which is conferred every fourth year for meritorious work in medical science, to Dr. Philip for his investigations and work in connexion with tuberculosis.

THE PROHIBITION OF THE USE OF UNWASHED FLOCK FOR BEDDING.

DEPUTATION TO MR. BURNS.

A DEPUTATION representing the Manufacturers' Association of Great Britain, the London and Bristol centres of the Furnishers Chambers of Trade, and various bedding and flock manufacturers, was received by Mr. Burns with Mr. Herbert Lewis, M.P., at the Local Government Board on June 29th. Among the gentlemen present were: Mr. T. R. Freeman, Mr. Ben H. Morgan, Mr. Peter Fyfe, Mr. H. E. Kershaw, Mr. Maggs, Mr. Midwood, Mr. Nicoll, Mr. J. Osborne, Mr. Weaver, Mr. F. Wookey, J.P., Mr. Adolphe Smith, representing THE LANCET, and others.

Sir JOHN BARLOW, introducing the deputation, said this was a subject in which he had taken great interest. He had been very much impressed with the difference in flock before and after it had been cleansed. He pointed out that, so far as could be ascertained, the trade was unanimous in its desire for legislation of the kind which the deputation would ask for.

Mr. T. R. FREEMAN said that the deputation had been called together by the Manufacturers' Association of Great Britain. The movement for legislation to compel the washing of rag flock was not a new one, since the agitation had originated as far back as 1902. He referred to the report recently made by Dr. R. A. Farrar of the Local Government Board on the manufacture and sale of unwashed rag flock, which effectively supported the agitation which had been going on for so many years. He did not think that the requirements of such a Bill as they were asking for would impose any hardship on manufacturers, furniture and bedding makers, or the public generally. It might raise the selling price of the commoner classes of goods, but not sufficiently to cause any hardship. The importation of unwashed rag flock should not, of course, be permitted. The question had been taken up from the point of view of public health by many corporations and public bodies. Amongst those who had passed resolutions on the subject were the Glasgow corporation, the Brentford urban district council, the Bristol corporation, the Bath corporation, and the Hereford corporation. Other public bodies, amongst whom were the Portsmouth town council, the Devonport sanitary committee, and the Crewe corporation, had expressed themselves in favour of the movement for legislation to prohibit the sale of unwashed rag flocks for the making of beds, &c. He would like to mention that the press had taken the matter up very strongly, more especially the medical press. He did not think that any opposition to the proposed measures would be forthcoming from any section of manufacturers of rag flock.

Mr. BURNS asked to what extent Mr. Freeman was justified in saying that the trade was unanimous.

Mr. FREEMAN replied that they did not in that statement include the cotton flock manufacturers of Lancashire, because their goods hardly came under the heading of rag flock.

Mr. BURNS said that he had in his hand a letter from a gentleman who said he had been 30 years in the trade and had never had so much as a day's illness, although he was handling these flocks every day of his life. The writer was of opinion that this agitation was for legislation of the grandmotherly type. He admitted that if all the flock makers were compelled to wash their rags it would mean an improvement in the cleanliness of the mattresses, but at the same time it would increase the cost 50 per cent., and as this material was only used for making up articles for the poorer classes the extra cost as a hardship to them should be taken into consideration. He had thought it better to let Mr. Burns know

that there were two opinions upon this subject, although the deputation might appear to be unanimous.

Mr. WEAVER said he was not a rag flock manufacturer; he bought immediately from the manufacturers and made beds for local distribution. He would very much like something to be done for the purification of common flock. He had not bought any but washed flock for a good many years, and he had not lost thereby.

Mr. MAGGS said that his firm employed upwards of 100 men in the manufacture and remaking of bedding; they never used anything but washed flock. The difficulty they laboured under was that whereas they had to ask from 12*s.* to 14*s.* for a mattress, those using the unwashed flock could undersell them to the extent of 2*s.* or 2*s.* 6*d.* Many people besides the very poor seemed to think that cleanliness in bedding did not matter as it was out of sight. He could vouch for the absolute accuracy of the state of things described in Dr. Farrar's report. He believed it could be obviated if the Bill they asked for were passed into law.

Another speaker said he had pleasure in substantiating the report of Dr. Farrar and the articles that had appeared in THE LANCET.[1] His family had been in the trade for more than 100 years.

Mr. NICOLL (of Messrs. Atkinson and Co., London) said they were users of rag flock; they had never gone in for the inferior bedding that was so much complained of, although they had had it sent to them to be remade; they had in many instances found the material positively unfit to be reworked and had destroyed it. A mattress could be made up with clean new flock at a cost of only 2*s.* or 3*s.* more than with unwashed flock.

Mr. PETER FYFE said the report of Dr. Farrar stated very clearly that the extra cost of clean as compared with dirty flock was from 1*s.* 8*d.* to 2*s.* 6*d.* per bed, and that manufacturers had agreed that 2*s.* was about the average extra cost. He drew attention also to the fact that food was often stored in the same room as that in which the bed was kept, and that milk, broth, and foodstuffs of that kind were liable to gross contamination in houses where beds containing dirty flock were in use. He described some experiments which had been carried out in Glasgow, and which proved that the making of the beds caused a great deal of dust containing bacteria to be deposited in milk standing in the rooms in which the beds were made.

A flock manufacturer of 40 years' experience, who "knew as much about rags as most people," corroborated Dr. Farrrar's report. Nowadays anything that would go through a tearing machine was put into beds. He had put up washing machinery at a large expense, but it was standing idle; the trade refused to pay for washing and he could not afford to do it for nothing. He considered the trade was in a worse state than ever before and that manufacturers wanted protection against themselves.

Mr. F. WOOKEY (Dublin) said the leading bedding manufacturers in Ireland were totally in accord with the views put forward by the deputation.

Mr. MORETON (Glasgow) said the health committee of the corporation was very anxious that something should be done to prevent the use of filthy material for beds.

Mr. ADOLPHE SMITH said the washing of the flock would not advance the price of a bed more than it was now raised by fluctuations in the price of rags, so that the hardship to the poor would be no greater than they already suffered when rags were dear. He also drew attention to the fact that unwashed rags were frequently contaminated by human dejecta and often contained the specific germs of disease.

Mr. BURNS, in reply, said he was pleased to see so representative and unanimous a deputation. The past attitude of the Local Government Board had been to a great extent in accord with the general representations made as to the necessity of ensuring the cleanliness of rag-flock used for mattresses, pillows, &c. So far back as 1885 Dr. H. F. Parsons, on behalf of the Local Government Board, had gone into one aspect of this question and recently Dr. Farrar, at his special request, had made careful inquiry into the whole question and had submitted an admirable report upon it which was as strong as it was moderate and as moderate as it was forcible. He was very glad to know that both flock manufacturers and flock users endorsed Dr. Farrar's general findings, and he hoped they would regard this report as a general earnest of the desire of the Local Government Board to carry out the reasonable objects the deputation had in view. He wanted if possible to carry the trade with him in this matter, and he therefore noted with pleasure that the trade were practically unanimous. All the public health authorities were agreed that on sanitary and medical grounds, as well as on grounds of decency, a case had been made out either for legislative or administrative action. He had previously conveyed to Sir John Barlow his view that perhaps the shortest and simplest way to accomplish what was desired would be a Bill giving the Local Government Board power, such as it had in respect of public health matters, to make regulations to deal with this particular evil. Such regulations could be easily and quickly varied to meet changes in the trade, whilst any amendment of an Act of Parliament would involve considerable time and expense. But whether the matter was accomplished by a direct enactment or by regulations did not particularly concern them at the present moment, so long as the object they had in view was reasonably and practically carried out. In this matter other Departments, such as the Home Office and the Board of Trade, must be consulted, but so far as the Local Government Board were concerned he would frankly tell the deputation they were kicking at an open door. He believed that this was an evil which ought to be mitigated and perhaps abolished. He hoped that next year it might be possible to do something in the way of legislative and administrative action, but he was afraid this was as soon as action could reasonably be expected. At any rate, they might rely upon it that he would do all he could to give practical effect to what was reasonable in their demands as soon as opportunity presented itself.

[1] THE LANCET, Sept. 7th, 1907 (p. 727), and Jan. 23rd. 1909 (p. 280).

ANNUAL MEETING OF THE POOR-LAW MEDICAL OFFICERS' ASSOCIATION.

THE Poor-law Medical Officers' Association of England and Wales held its annual meeting in the council chamber in the town hall, Halifax, on July 1st. The President, Surgeon-General G. J. H. EVATT, C.B., occupied the chair, and amongst others accompanying him were Dr. Major Greenwood (London, secretary), Mr. A. A. Napper (Cranleigh, treasurer), Mr. J. Smith Whitaker (medical secretary of the British Medical Association), and Dr. A. Drury (local secretary). There were also present the Mayor and Mayoress (Alderman and Mrs. F. Whitley-Thomson), the Rev. Prebendary Burn, D.D., vicar of Halifax, the Ven. Archdeacon Norris, Dr. J. T. Neech (medical officer of health of Halifax), and many local medical practitioners.

The MAYOR, welcoming the Association, recognised the obligations which laymen were under to the medical profession, who were so self-sacrificing to the community and did such a great deal gratuitously to relieve the suffering of those less comfortably circumstanced. Among the medical profession none were more generous in that way than the Poor-law medical officers.

The PRESIDENT, replying, remarked that however much they might differ on the Poor-law Commission's Reports, the great principle they stood by was the value of human life. If they built on that rock they would not go astray.

The report, a copy of which had been posted to each member, was approved, as also was the financial statement, submitted by Mr. Napper, showing a balance in hand of £153 2*s.* 4*d.* The retiring officers were re-elected. The secretary reported that an unfortunate accident the previous day prevented the attendance of Mr. D. B. Balding, of Royston, the oldest member of the association. He had dislocated his arm.

Dr. MAJOR GREENWOOD read a paper on Poor-law Medical Reform: What it Should Aim At. He urged that the carrying out of the medical proposals of either the Majority or the Minority Reports of the Royal Commission would not only disintegrate their service but would bring about in addition ruinous changes in the whole profession of medicine.[1]

Dr. JOHN C. MCVAIL, next read a paper on

The Medical Profession and Poor-law Reform.

Poor-law reform, he remarked, was coming and would not be long delayed. The appointment of the Royal Commission was the result of anxious suspicion on the part of the thinking

[1] The paper was published in THE LANCET last week.

public that reform is necessary. The Commission's reports have proved that the anxiety was more than justified and the proof has quickly penetrated and permeated the national mind. The State is suffering seriously owing to the defective physical condition of many of its members. It is suffering both financially and morally, both nationally and internationally. The defects are to a large extent remediable, but remedy on wrong lines might bring in its train evils as serious as those which it is sought to remove. It is essential that the sense of individual and family responsibility and independence be maintained, and, where it has already lapsed, that it be restored. The State, whilst doing its own duty, must make it part of that duty to see that the individual does his. It is along this path that reform should travel. "You will agree with me," he said, "that the medical profession ought to be in the reform movement. It should be so as a matter of public duty: it should be so also in order to protect its own legitimate interests. If, in respect of the medical aspects of the question, the profession were to lag behind, if it were by any chance to forget for a brief time what we all recognise, that the patient is not made for the doctor but the doctor for the patient, that the public is not made for the profession but the profession for the public, then in the eyes of the world we would be discredited and condemned. Fortunately, reform, as it appears to me, does not require the sacrifice of the interests of medicine. On the contrary, any scheme worth the name will be bound to include a very great amelioration in the existing conditions of practice amongst the wage-earning and poorer classes. For the medical questions in respect of pauper and wage-earner are so related to each other that they cannot effectively be dealt with apart. The defects requiring to be remedied include those relating to (1) medical charities, (2) the Poor-law medical service, and (3) club and friendly society practice. The sufferers in each of these three classes include both the patients and the doctors.

"1. Under *Medical Charities*," said Dr. McVail, "the patients suffer by that insufficiency of attention which frequently it is alone practicable to give to individual cases in crowded dispensaries and outdoor departments of hospitals, by the fact that many cases are not dealt with from their beginning to their end, and by the moral deterioration which inevitably results from the acceptance of charity by persons who do not require it, but who are tempted to ask it because of the fact that it is so easily obtainable. The doctors suffer by the deprivation of fees which rightly belong to them and which they badly need, and by the sore and rankling knowledge of the injustice under which they labour.

2. The defects of the *Poor-law Medical Service* as they appear to this association were brought before the Royal Commission by Dr. Major Greenwood. The rubric of his Statement contains as its first item 'Inadequacy of salaries of Poor-law medical officers and dangers therefrom.' The dangers referred to are public dangers. As the Statement points out: 'If the Poor-law medical service is underpaid the sick poor will sooner or later suffer from the inadequacy of the salaries paid to the district medical officers in many parts of the country.' In this meeting it is unnecessary to labour that argument, nor do I require to quote from other parts of the Statement relating to such matters as unsuccessful applications made to boards of guardians for increased salaries, operation fees, midwifery fees, anæsthetists' fees, nor to the hardships which the district medical officers suffer from indiscriminate medical relief, nor to Dr. Greenwood's observations on the frequent failure of boards of guardians to act on a principle laid down by themselves. It is, indeed, easy to understand Dr. Greenwood's evidence that 'It has been the desire of the Poor-law medical service that they should come under some central authority rather than be, as it were, at the mercy of many boards of guardians.' The central authority here referred to is, of course, a Government authority. Any of you who may have read my own report to the Commission must know how strongly I hold that the present system is defective alike as regards the Poor-law medical officers and the poor themselves.

3. Concerning the third class of defects, those relating to *Club and Friendly Society Practice*, they are essentially similar, and need not be dilated on to this audience, many of whom must be acquainted with them by actual daily experience."

What was to be the nature of the reform and how was it to be achieved? A common policy beneficial to all and covering the whole field of reform was practicable if, laying aside what were wrongly believed to be group interests, the profession took united action towards its achievement. The policy was the establishment throughout the country of a system of medical provident institutions, open on the one hand to all medical men whose conduct did not render them unworthy of the service, and on the other hand to all the wage-earning and poorer classes.

"Having," said Dr. McVail, "well considered the details, the profession ought to adopt and organise such a system, as being the method under which any man belonging to the classes in question could, for himself and his dependents, be assured of medical attendance whenever it might be required. The terms and conditions would, of course, have to be reasonable, otherwise the whole machinery would remain inoperative. The necessary annual contributions would be made either directly by the beneficiaries, or partly or wholly by others, who might be private individuals, or charitable organisations, or public authorities. All who make whole or partial contribution on their own account would have a choice of doctor, but if the contribution were wholly by a public authority then it, and not the beneficiary, would have the choice. Unless the State were to make a definite offer to contribute, the scheme would have to be organised by the medical profession. There would be a central committee in general control, but local committees would have a very large measure of autonomy, as details would have to vary according to circumstances. If there were a State subsidy, paid out of either rates or taxes, then the State would have a share in the management. As regards the amount of annual contribution required on behalf of each insured person the decision would be with the local medical committee, subject to central approval, the organised medical men being simply in the position of stating to the public on what terms they would provide attendance through the institution. Age at entry would be one factor in deciding the amount, the condition of health would be another. Any special or additional services would have to be the subject of special additional payment. In my view parents ought not, as a general rule, to be allowed to select only certain of their children for entry; all up to a given age should be included, but this might be subject to exceptions according to circumstances. There would be a wage-limit varying to some extent according to the number and earnings of a man's family. To prevent illegitimate competition for patients by the excessive prescription of needless bottles of medicine all medicines should be supplied at wholesale price from a dispensary belonging to the institution and should be paid for by the patient. Doctors guilty of touting or unethical conduct would be liable to expulsion by the committees. An important question is, How will a poor labourer be able to pay the contributions for himself and his family? The answer is two-fold. Private benevolence and organised charity would find a much better field in paying part, or occasionally the whole, of such contributions as are required for a man's wife and children, than in subscribing to charitable dispensaries which are so largely abused by the comparatively well-to-do. And as regards the labourer himself, there is every prospect of the early establishment of a great national scheme of invalidity insurance, under which contributions would be made partly by the State, partly by the employer, and partly by the workman. In my own view, indeed, the contribution of the State ought to extend not merely to the workman but to his wife and family. The country should bear some share of the burden in the interests of national health, but the individual should also bear a share in the interests of personal and family health. There should be mutual outlay for mutual benefit, and the results would include diminution of chronic pauperism due to ill-health, so that the State would be remunerated in this as well as in other directions for its expenditure."

Dr. McVail continued his interesting paper as follows: "What now are the medical objections which have been raised to such a scheme? I can only refer to a few of them. 1. There is the financial question. It is urged that if the scheme were largely adopted, the loss of private practice amongst the poorer classes sustained by medical men would be greater than their gain in provident institution practice. The reply is that that would altogether depend on the terms

of the service, and these terms would be fixed by the profession itself. Naturally the charges would not be so high as to debar entrants desirous of obtaining the benefits of the system. But neither ought they to be so low as to result in loss to the doctors. Fundamentally the scheme should be not charitable but provident. It is to promote insurance against the serious liability to illness involving heavy costs for medical attendance. It is to prevent the patient from being harassed in sickness and hampered in convalescence by the fear of doctor's bills. It is to prevent the doctor from being worried in mind and crippled in means by bad debts or long-delayed payments. A properly adjusted scheme would pay both doctors and patients. If it were to fail as regards the former it would be the profession's own fault in not fixing a reasonable scale of payment. Common sense would determine in each locality what the charges should be and how they should be levied. Of course, a man who in any year had an excessive amount of illness in his home would pay less than if he had not been insured, and the doctor would have got more from him as a private patient. But that is of the very essence of the scheme. All the gain is not to go to the doctor nor all the loss to the patient. Please let me insist on your realising the essential distinction between charity and insurance. A fire or life insurance society is a valuable organisation, but it is not a charity. It is valuable both to the proprietors or shareholders and to the insured. The latter are protected from a danger against which they cannot guard by personal savings, a danger which might ruin them, and they get a financial security and a mental ease which are more than worth the money. At the same time the proprietors or shareholders receive interest on their investment. There is no charity on either side, but the arrangement pays both. That is what should be aimed at by medical provident institutions, and the medical profession have just the same right to fix their terms as the insurance society have. In fixing these terms let me say again that it will not profit them to charge either too much or too little, as in the one case they will drive away custom and in the other they will punish themselves. 2. It has been alleged that the scheme would involve a great increase in gratuitous medical work. That is, perhaps, the most surprising of all the charges that have been made against it. One of its main objects would be to minimise such work, and I believe it is calculated to effect that end. It will always be open to the medical man to exercise voluntary charity towards the needy and unfortunate whose condition may appeal to his sympathies, but the scheme ought to cause a very great diminution in the involuntary gratuitous work done by the exploitation of the services of medical men in public dispensaries and in the semi-gratuitous work done for friendly societies and clubs. 3. The scheme has been denounced as equivalent to a great extension of contract practice. But in that connexion I beg you not to be led away by mere words. In the House of Commons Mr. Balfour and Mr. Asquith heartily agreed in denouncing labelling as counterfeit coin for reasoning. Contract practice is good, bad, or indifferent according to circumstances; in fact, it has been mainly bad, because of individual bargaining, say between the doctor and the club, or the doctor and the guardians, or between the doctor and the provident dispensary under lay management. And such contract practice will go on indefinitely unless the medical profession unite to stop it.

These remarks on contract practice bring me to the question which must specially interest this association—namely, the relation of such medical provident institutions to the existing Poor-law service. Of the ten questions submitted to you by the council the fifth was, 'Are you in favour of a Public Assistance Medical Service based on provident dispensaries, dispensaries subsidised by the State, and contract practice generally?' And by an overwhelming majority—by 83 per cent. to 12 per cent.—you have replied in the negative. If this decision were irrevocable further discussion would be unavailing so far as the Poor Law Medical Officers' Association is concerned, but as it still requires confirmation I would venture to urge on your attention the view that Poor-law practice could be improved by being conducted through the medium of medical provident institutions. And in the first place, as regards safeguarding the interests of the existing district medical officers, it is to me inconceivable that the profession as a whole would approve of any scheme which did not fully protect the 3500 doctors who are already engaged in district work. If local Poor-law bodies, whatever they may be, were to enrol in the provident institutions all paupers on their permanent lists they would still employ the present district medical officers, not directly, but through the institutions. As the generation gradually dies out each local authority would exercise its judgment as to appointing a single successor or from time to time making a choice from the list as they might deem best. Security of tenure of the present officers would, under any just scheme, in no way be affected.

Looking to the exact terms of the question submitted to you ('Are you in favour of a Public Assistance Medical Service based on provident dispensaries subsidised by the State, and contract practice generally?') I trust the Council will not think me trespassing on their courtesy if I suggest that the last four words 'and contract practice generally' seem to me rather to tend to confuse the issue. Give a dog a bad name and you may as well drown him. Contract practice has, under bad conditions, obtained a bad name and the reference to it in the question may possibly have prejudiced the answer. Also, I am not quite clear how the question as it stands is to be construed. Is it to be read as referring to 'a Public Assistance Medical Service based on provident dispensaries subsidised by the State and based also on contract practice generally'? If so, how could it be based on both at once? The State contribution would be precise in amount, and the whole contract would be not general but perfectly specific. Or, if the objection is to 'a Public Medical Service based on contract practice generally,' is not every one of you already paid by contract with the guardians, the contract being an annual salary for your work? If so, the choice would be between two sorts of contract whose comparative merits would depend on their terms. And the doctors themselves would manifestly have a much greater say in fixing terms under a medical provident system than they have in individual negotiation with the guardians. You yourselves know, and have complained to the Royal Commission of your difficulties on that score. As a third alternative it seems out of the question to suggest that there are two separate queries under the one heading: (*a*) Are you in favour of a Public Assistance Medical Service based on provident dispensaries subsidised by the State? and (*b*) Are you in favour of contract practice generally? If that were so then the two queries would, of course, have to be put separately. Anyhow, it does seem possible that if the question had ended without including its last four words the majority might have been less than 83 to 12. Next, I trust I will be pardoned for commenting on part of the council's fifth resolution:—

> That the medical treatment of paupers, or State patients, by provident institutions is strongly to be condemned. That what is done for the State should be paid for by the State *at an equitable rate*. That the payments accepted at provident dispensaries in order to encourage individual thrift cannot form any sound basis for State payment for the medical charge of the destitute.

No one will deny the axiomatic statement 'that what is done for the State should be paid for by the State *at an equitable rate*.' Manifestly, it ought to; but why assume that the State would not contribute equitably? If it is replied that present State payment to the Poor-law Medical Service is inequitable, then that is a reason against the present system but not against any other. Nor is it justifiable to assume that the payments now accepted at provident dispensaries will be accepted under any new scheme. That is the very argument which has been used against a medical provident system applied to the wage-earning classes independently of the Poor-law. It has been urged that club practice is bad—that doctors are sweated and patients sometimes neglected, and therefore it is alleged, provident dispensaries are not the remedy. But, once more, it is for the profession to determine on what terms it would insure people under a new system. Another assumption in the resolution is that under the suggested scheme there would be no difference in the charges for ordinary members and for paupers. But both age and health would be considered in the case of every ordinary applicant, and the same principle would apply to paupers. They would often be paupers because of their ill-health, and manifestly these could not be accepted as healthy. If in addition to ordinary medical attendance the State were to wish, as I personally trust would be the case, periodical medical inspection independently of illness, that work would have to be

paid for. And if the local Poor-law authority were to insist on the absurd amount of clerical work which the district medical officer is at present called on to perform, that also would have to be thought of in fixing the terms as compared with cases involving no such duty."

Referring to one of the motions of the council of the Association, to be placed before the meeting as a resolution, he observed how well it would be fulfilled under a medical provident scheme. The council are of opinion, according to the resolution—

That a system of "part time" is better for the interests of the sick poor. That it is better for the latter to be attended by the same doctors as the rest of the community, rather than by officials appointed to attend only on the poor.

"Manifestly," said Dr. MacVail, "that would be exactly the effect of the system which I have been advocating. I think that the answers to Question 5 and the resolution giving effect to these answers are based on serious misconception. I am most sorry to disagree with you. It would be much easier and pleasanter to concur or be silent, but you have asked me to address you and I am bound to express what I so strongly believe. To do otherwise would be unjust both to yourselves and to me. The fundamental importance of union on the part of the medical profession in respect of this great subject is manifest, and I ask you to pause before committing yourselves to the resolution. My time is exhausted and there are many important points which it has been impossible even to mention, but no doubt these will be brought forward in the course of discussion.

In this morning's newspapers I read the important announcement by the Chancellor of the Exchequer that he hopes next year to introduce a great scheme of invalidity insurance, to apply to 13,000,000 of male and female workers, or well on to a third of the total population of the United Kingdom. Contract practice on a very large scale appears to be coming, whether you like it or not. The question is, Will the profession be prepared to meet this crisis by having an organised and reasonable scheme of medical insurance ready to be submitted to the Government when the time comes, or will each section take its own course and throw the Government's scheme into the hands of the sick clubs as being the only bodies in a position to deal practically with the new problem? If the latter, then the last state of the general practitioner will be worse than the first."

Discussion on both papers was then invited. On the agenda were seven resolutions, all bearing on the subject of Poor-law reform, and founded on the answers sent to the council of the Association by their members. It was decided to take them separately.

Dr. GREENWOOD proposed the first, which was in the following terms:—

That it is not desirable that there should be a "break up" of the present Poor-law system; that proper reform of existing institutions would be better for the welfare of the sick poor and the good of the nation.

Mr. DRURY formally seconded.

Mr. SMITH WHITAKER remarked that in dealing with this matter there were three sets of questions to consider: (1) the question of the actual terms of employment of the existing officer or any officer of the future, whether he was fairly treated and received a fair day's pay for a fair day's work; (2) as a body of practitioners they were interested in the question as to what was going to be the bearing of it on the interests of the medical profession as a whole; (3) there were the broad questions of social policy, some of which hardly seemed to concern them as a medical profession at all, though they did concern them as citizens.

The PRESIDENT said he was not afraid of the State and he had no grievance whatever against it. In the Poor-law, as in the army, there must be both full-time and part-time men. The Poor-law medical officer and the sanitary authority must come together.

Mr. V. BATESON (Bradford) thought that if the Poor-law were broken up medical officers would not be left as free-lances, but would come under some other authority. The guardians were experienced men, and if they were abolished there would be a new element with authority but without the knowledge of past service.

Mr. W. HOLDER (Hull) suggested that it was too early for them to express an opinion as to whether boards of guardians should be changed. What they had to do was to press that justice should be done to them and, through them, to the poor for whom they acted.

After further discussion it was agreed to postpone consideration of all the resolutions until the next meeting, to be held a month hence in London, the meeting being of opinion that at the present juncture it was inadvisable to express a definite opinion by resolution on the question.

On the conclusion of the meeting the Mayor and Mayoress received the visitors in the Mayor's parlour, where afternoon tea was served.

In the evening the annual dinner was held at the White Swan Hotel, the President being accompanied, amongst others, by the officers of the association, the Mayor and Mayoress, the Rev. Dr. Burn (vicar of Halifax), the Ven. Archdeacon Norris, Mr. J. W. Miller, J.P. (chairman of the Halifax Board of Guardians), Mr. Smith Whitaker, Mr. P. H. Bagenel (Local Government Board Inspector), and Dr. J. T. Neech (medical officer of health of Halifax), who represented THE LANCET.

In addition to the loyal toasts the following were submitted: "Poor-law Medical Officers' Association," proposed by the Rev. Dr. Burn and responded to by Dr. Greenwood; "The Mayor and Mayoress and the Corporation of Halifax," proposed by the President and responded to by the Mayor; "The Guests," proposed by Mr. Drury and responded to by Mr. J. W. Miller, Mr. Smith Whitaker, and Mr. P. H. Bagenel; and "The President," proposed by Mr. Holder.

During dinner selections were played by an orchestral society, and between the speeches songs were given by Mrs. Drury, Mr. John Needham, and Mr. Leeming (Huddersfield), Mrs. Drury also officiating as accompanist.

The local arrangements for the meeting and dinner were made by Mr. Drury and everything passed off satisfactorily.

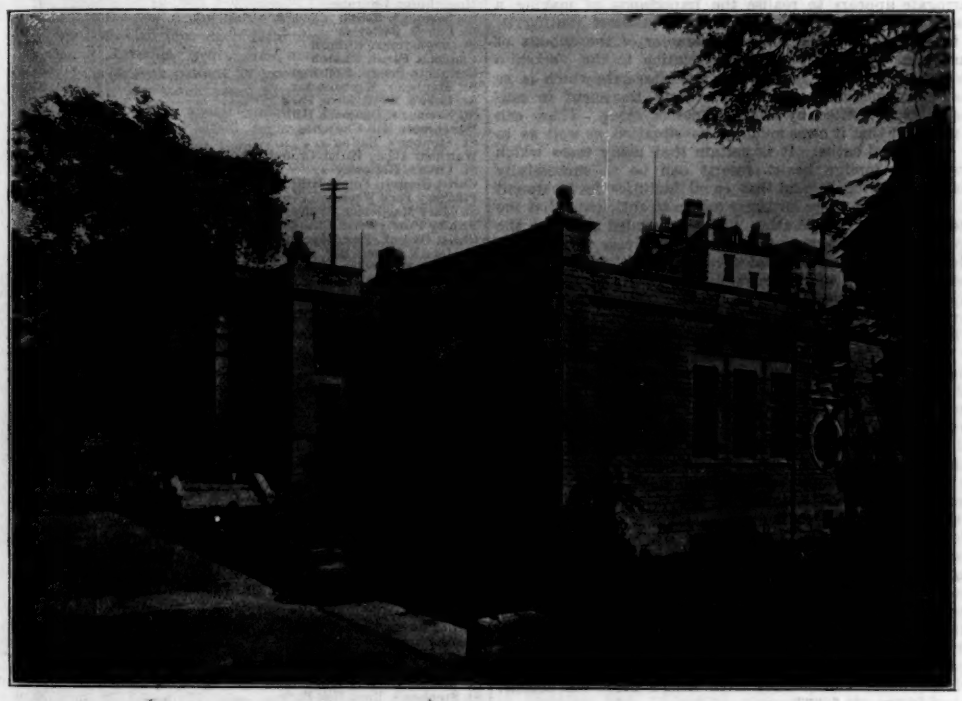
THE EXTENSION OF THE ROYAL BATHS AT HARROGATE.

THE corporation of Harrogate does not mean to lose sight of the fact that only by maintaining the service and efficiency of its baths and medical treatment can the place hope to rival, or possibly outstrip, its continental competitors. The recent action of this body, at all events, carries such a conviction. On Saturday last, July 2nd, a large party of medical men and representatives of the press from all parts of the United Kingdom visited Harrogate to witness the opening of the new buildings attached to the Royal Baths which are to be devoted to the application of the latest achievements of balneo-therapeutic practice. As a result of this visit it has become abundantly clear that the members of the corporation have approached the question of the future of Harrogate as a health resort, its baths, its sanitation, and its social attractions in a perfectly systematic and scientific way. They have taken a great deal of trouble to find out what the experience of health resorts at home and abroad could teach them.

In some matters it was evident that Harrogate furnished an example which might be followed with advantage by other places; in others it was acknowledged that its position was capable of further progressive movement. To-day Harrogate offers facilities for treatment by hydrotherapy, electric application, and so forth, which leave it unrivalled as a spa in this country, presenting advantages to the patient which he is so prone to think (but wrongly so) can only be conferred upon him by health resorts abroad. It is not realised sufficiently how rich, as a matter of fact, this country is in regard to natural mineral waters, and how varied in character these waters are, in spite of their occurrence in the confines of these islands, narrow compared with the large areas of France, Germany, and Austria. And yet Great Britain has its remarkable thermal waters at Bath and at Buxton, its saline aperient waters at Cheltenham and Leamington, its alkaline waters, sulphur and magnesian waters at Harrogate, its brine baths at Droitwich, its iodo-water at Woodhall, its chalybeates at Tunbridge Wells and elsewhere, and various mineralised waters in Wales. It is doubtful whether such a number and variety of waters can be claimed in a similarly limited area elsewhere in the world. But this fact is very largely disregarded, and British enterprise receives in this matter but scant acknowledgment, and these valuable resources of the country do not receive that patronage which they undoubtedly merit. There is no reason for regarding the natural mineral waters and springs

of this country as of less medicinal value than those abroad. On the contrary, they may rightly be counted as medical assets in the same way as similar waters are esteemed elsewhere. Moreover, apart from the valuable therapeutic properties characteristic of the natural waters of our home watering-places, it is a step of unquestionable importance that the authorities who are responsible for organising the various methods of treatment are rapidly beginning to realise the value of various accessories to hydro-therapeutic practice—as, for example, the installation of electrical appliances, radiant light and heat treatment, inhalation and atomisation for throat treatment, Plombières treatment (bowel irrigation), steam poulticing, treatment in peat baths, and so forth. In this direction Harrogate has recently made very notable advances, and the up-to-date appliances in the new buildings, which are situated close to the Winter Garden, were inspected with considerable interest by the medical visitors present on the occasion of the inaugural ceremony of Saturday last.

Previously to this ceremony the Mayor of Harrogate (Councillor A. B. Boyd-Carpenter), at a reception held in the Winter Garden, introduced his audience to some remarkable facts illustrating the increasing popularity of Harrogate as a place for cure. Harrogate has claimed to have ministered to the needs of 628,000 water-drinkers and 116,000 bathers during the year. This number is growing rapidly, and in some departments of treatment, where in the past in the course of 12 months the patients numbered a thousand or so, they now number in a little over half the time nearly 9000. Such an extraordinary advance in the number of patients applying for treatment in a short period has amply justified the corporation in embarking upon the present extension scheme, which has cost £10,000, bringing the total amount of money represented as an investment in mineral waters and baths by the corporation to nearly £250,000. The new extension is shown in the accompanying picture.



The Royal Baths Extension at Harrogate.

After the formal opening of the extension of the Royal Baths by the Mayor of Harrogate, the medical visitors were shown systematically over the baths in small groups under the guidance of one of the local practitioners and of one of the officials. Every opportunity was afforded them of studying the character of the baths and the methods of their administration, and the orderly and thorough manner in which this was done is worthy of special commendation. The valuable sulphur baths, which together with its numerous waters have earned Harrogate its reputation, are too well known to require special description. There are two varieties—the saline sulphur baths and the alkaline sulphur, both given in various strengths. The saline sulphur baths are specially used for gout, rheumatoid arthritis, and for the reduction of increased arterial tension, while the alkaline sulphur baths are chiefly used for diseases of the skin. In order to utilise to the full every means devised as a result of modern advances in spa treatment, the various forms of bath in use at continental spas have been introduced at Harrogate, and an imposing list of baths is now at the disposal of patients under the direction of their medical attendants. Among these are various forms of bath combined with massage, including what is described as the Harrogate massage douche on the Aix-les-Bains system and the Vichy douche. In both instances the duration of the bath is 20 minutes, and they are prescribed for cases of chronic gout, for gouty and neurasthenic dyspeptics, and for some cases of obesity. It is claimed that the general tendency of the Aix douche is to lower blood pressure while the Vichy douche tends to raise it.

The facilities for the application of the method of treatment carried out at Plombières-les-Bains, using certain of the Harrogate waters for irrigation of the large intestine, have been considerably increased, and this ingenious method of treatment is being extensively used in cases of mucomembranous colitis, as well as in chronic simple colitis and chronic constipation. Since the introduction of the Plombières treatment at Harrogate in 1905 the number of patients undergoing it has greatly increased, and this fact is one of the reasons which have necessitated the enlargement of the baths. There can be no doubt that this treatment can be carried out effectively at Harrogate. A new installation is that for the use of atomised mineral water, medicated if desired, on the system employed at Bad-Ems. This will

enable 16 patients to be treated simultaneously. Various forms of apparatus were seen in working order for the application of sprays to the nose, post-nasal region, larynx, and bronchi. Some of the Harrogate waters are stated to exert a stimulating influence on the mucous membrane of the respiratory passages, others a sedative effect. The installation is a good one and should prove a useful addition to the means of treatment available at Harrogate.

The Nauheim type of bath and the peat or mud baths are also available. A new apparatus for preparing and mixing the peat was shown in the new wing to the visitors. The peat is obtained from the Yorkshire moors, and in the baths sulphur water or brine may be added. The numerous varieties of hot air, vapour, and electric baths are all installed at Harrogate. An interesting apparatus for cataphoresis and ionic medication was also on view and was explained to the visitors. This method of treatment is given in some cases of neuritis, sciatica, lumbago, and neuralgia.

The baths are conveniently arranged and are luxuriously fitted up, the general comfort and convenience of the patients being considered in great detail. The corporation of Harrogate appears to realise the importance of making a health resort as attractive as possible to those visiting it. It is claimed that the bracing character of the climate of Harrogate, which it owes to its relation to the Yorkshire moors, obviates the necessity for the after-cure which is so often recommended after the course of treatment in continental spas visited by similar types of cases. There can be no doubt that it owes much to its situation as well as to its waters and baths. It is certain that many cases which now go to foreign health resorts can be as successfully treated at Harrogate, and that equal facilities for treatment are offered, and there is every reason to anticipate that the enterprise of its corporation will be rewarded and that the popularity of Harrogate will increase every year.

In the evening a banquet given by the Corporation and Medical Society of Harrogate was held in the Hotel Majestic, when there were about 300 guests present. The Mayor occupied the chair, and he was supported on his left by Sir Dyce Duckworth, Mr. E. C. Meysey-Thompson, M.P., Sir Thomas Oliver, and others, and on his right by Major-General Bullock, Sir Malcolm Morris, Mr. Mayo Robson, and councillors of the corporation. Mr. S. A. Vasey represented THE LANCET. The toast of "The Mayor and Corporation of Harrogate" was given by Sir Dyce Duckworth, and that of "The Harrogate Medical Society" by Sir Malcolm Morris. The banquet was an obvious success and the whole proceedings were splendidly organised. At the conclusion of the banquet the guests proceeded to the Kurhaus, where an excellent programme of music was provided. It was generally conceded by the company that the arrangements provided by the corporation in regard to social comforts, amusements, recreation, and so forth, as very important adjuncts to treatment at Harrogate, were most commendable.

It remains to be added that the North-Eastern and Great Northern Railways furnished an excellent example of the expedition and comfort offered to travellers to Harrogate by their services. The journey from King's Cross was accomplished in exactly four hours.

METROPOLITAN HOSPITAL SUNDAY FUND.

UP to Thursday morning, July 7th, about £43,000 had been received at the Mansion House, the collections at the churches generally showing an increase. Among the additional amounts are:—

	£	s.	d.
Christ Church, Lancaster Gate	961	0	0
St. George's, Hanover-square	334	0	0
St. Peter's, Cranley gardens	282	0	0
Wimbledon Churches	210	0	0
St. Stephen's, South Dulwich	190	0	0
Holy Trinity, Kensington Gore	176	0	0
St. George's, Bickley, and Widmore Mission	151	0	0
St. Paul's, Avenue-road	148	0	0
St. Paul's, Portman-square	141	0	0
Holy Trinity, Paddington	141	0	0
Holy Trinity, St. Marylebone	138	0	0
St. Stephen's, Gloucester-road	134	0	0
Holy Trinity, Sydenham	118	0	0
St. Peter's, Brockley	118	0	0
All Saints, Margaret-street	112	0	0
St. James's, Paddington	109	0	0
St. John's, Penge	107	0	0
Union Chapel, Islington	107	0	0
Anon.	100	0	0
All Souls', South Hampstead	100	0	0
Spanish and Portuguese Synagogue	99	0	0
St. Matthew's, Bayswater	98	0	0
St. Barnabas, Kensington	96	0	0
Christ Church, Gipsy Hill	92	0	0
St. Leonards and All Saints, Streatham	81	0	0
St. Andrew's, Leytonstone	80	0	0
St. Paul's, Beckenham	74	0	0
Chipping Barnet Parish Church	71	0	0
St. Luke's, West Hampstead	71	0	0
St. Mary's, Stoke Newington	68	0	0
St. Matthew's, Denmark Hill	68	0	0
St. Michael's, Highgate	64	0	0
St. Philip's, Kensington	62	0	0
Blackheath Congregational Church	60	0	0
Ascension, Balham	60	0	0
Christ Church, Highbury	59	0	0
Stamford Hill Congregational Church	59	0	0
St. James's, Muswell Hill	57	0	0
Lewisham Parish Church	54	0	0
Marylebone Presbyterian Church	53	0	0
Miss M. E. Druce	50	0	0
Christ Church, Brondesbury	47	0	0
Hornchurch Churches	47	0	0
St. Saviour's, Ealing	46	0	0
St. Luke's, Battersea	45	0	0
St. Augustine's, Kilburn	45	0	0
Clapham Parish Church	44	0	0
Carmelite Priory, Kensington	42	0	0
St. Stephen's, Westminster	40	0	0
St. Luke's, Westbourne Park	40	0	0
St. Saviour's, Denmark Hill	38	0	0
Winchmore Hill Churches	38	0	0
St. Stephen's, Ealing	36	0	0
Waltham Abbey Parish Church	36	0	0
St. Luke's, Holloway	36	0	0
Christ Church, Forest Hill	35	0	0
Finsbury Park Wesleyan Circuit	35	0	0
St. Mary Magdelene, Wandsworth	35	0	0
Trinity Presbyterian Church, Clapham-road	35	0	0
Christ Church, Finchley, and Mission	35	0	0
St. John's, Potters Bar, with Bentley Heath Chapel	35	0	0
St. Mary Magdelene, Munster-square	34	0	0
St. Andrew's, Stockwell	33	0	0
St. Luke's, Hornsey	33	0	0
St. Barnabas, Pimlico	32	0	0
Epsom Parish Church	31	0	0
Gordon-square Catholic and Apostolic Church	30	0	0
St. Paul's, Deptford	30	0	0
St. Mary Magdalene, Peckham	30	0	0
Charterhouse Chapel	30	0	0
St. Andrew's, Kingswood	28	0	0
Christ Church, Wanstead	28	0	0
Christ Church, Southgate	28	0	0
Finchley Parish Church	27	0	0
All Saints, Clapham Park	26	0	0
Streatham Hill Congregational Church	26	0	0
St. Dunstan's, East Acton	26	0	0
St. Mary, Newington	25	0	0
Christ Church, Ealing	25	0	0
St. Anne's, Bermondsey	25	0	0
Emmanuel, Northwood	24	0	0
Cuddington Parish Church	24	0	0
St. Alban's, Holborn	24	0	0
St. Jude's, Kensal Green	24	0	0
St. Andrew Undershaft	24	0	0
St. Mary, Hendon	24	0	0
St. Barnabas, Clapham	22	0	0
Norden Parish Church	22	0	0
Christ Church, Woburn-square	21	0	0
Magdalene Hospital Chapel	21	0	0
Kentish Town Parish Church	21	0	0
St. Mark's, Notting Hill	21	0	0
St. Stephen's, Bush Hill Park	20	0	0

GERMAN CENTRAL COMMITTEE FOR MEDICAL STUDENTS' TRAVEL.—The Deutsches Zentralkomitee für ärztliche Studienreisen, of Berlin, W., 9. Potsdamerstrasse, 134B, has published a preliminary programme of a travel trip for medical students which begins at Stuttgart on August 31st next, and finishes at Freiburg i.B. on Sept. 18th. From Stuttgart the party proceeds to Friedrichshafen, Ragaz, Via Mala, Davos, Vulpera, St. Moritz, Lugano, Montreux, Leysin, Évian-les-Bains, Interlaken, Bern, and Freiburg i. Baden. The price of the trip, including railway fares, road conveyances, board and lodging, excluding wines and tips, amounts to 385 marks. A deposit of 20 marks must be made, and will be deducted from the price of the trip. The balance is payable by August 1st. Intending members of the party must apply to the general secretary, Dr. A. Oliven, at the above address. The presidents of the committee are Geheimer Ober-Med.-Rat Professor Dr. Dietrich, k.k. Reg.-Rat Professor Dr. Glax, Geheimer Med.-Rat Professor Dr. His, and Geh.-Med.-Rat Professor Dr. von Strümpell.

Public Health.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

The Health of Johannesburg.[1]—A sketch made in 1885 shows the high veld before the discovery of gold mines, when the undulating plains were broken only by occasional farm-houses with a wagon and a few cattle in the neighbourhood of each. The following year certain farms on the Witwatersrand were proclaimed as public goldfields, and the town of Johannesburg rapidly sprang into being. In 1896 there was already a population of 102,714, of whom half were white people, and to-day the population has reached 180,687, of whom rather more than half are whites, some 6000 are Asiatics, and the remainder are coloured South Africans. In some ways the town is an ideal residence for Europeans, for it is unique in possessing gold mines, coalfields, and a climate in which white men can work all the year round, at an elevation of nearly 6000 feet. In order to discover the importation of plague in the pneumonic form, pneumonia was for four years made a notifiable disease, but now it is found cheaper to inquire into each fatal case of the disease occurring among Asiatics, while free examination of the sputum of any suspicious patient is made. The death-rate from pneumonia for the three years brings out very clearly the high mortality which usually occurs in negroes and negroids. The deaths per 1000 among the whites and Asiatics varied from 0·8 to 1·9, being about the same average as in London, but the South African coloured population furnished from 6·6 to 9·6 deaths. An important contribution to the study of pneumonia among natives was made by Dr. G. A. Turner, the medical officer of the Native Labour Association, who found that in 160 necropsies the lungs of 93 contained the ova of schistosomum hæmatobium, though only 69 of the natives had died from pulmonary disease. This is an observation of some importance, because in Egypt it has always been held that the lungs are only rarely the site of the egg of this worm. Though it has been known for nearly half a century that the bilharzia disease exists in South Africa we were hardly prepared for Dr. Turner's figures. As the result of 971 necropsies on natives from all parts of South Africa he found that at least 80 per cent. were infected. Dr. A. W. May, the Government bacteriologist, is reported to have found another rarity, a cyst containing terminal-spined bilharzia eggs in the stomach of an imported Chinaman. The number of cases of enteric fever was during last year the lowest on record, and the cases will probably diminish still further when the municipality has completed the extension of the water-carriage system of sewage disposal, and the universal earth-closet becomes a thing of the past. In two of the small outbreaks of enteric fever the spread of the infection was traced to a carrier, in each case a native employed in a dairy. Both carriers were isolated, and one of them was treated with a vaccine prepared from the organism which was isolated from his urine. Of the natives employed by the municipality who contracted typhoid fever, 71 per cent. belonged to the scavenging service and were employed in handling night soil, &c. Of the deaths from tuberculosis, more than one-third occurred amongst miners employed underground, most of them being machine drillers and suffering from silicosis, while it is stated that many other miners returned to Cornwall to die from phthisis. Clerks and salesmen furnished the next largest number of deaths from tuberculosis, and some of these were ex-miners. A great danger is the steady increase of phthisis among natives, who succumb rapidly, for more than half the 1129 cases registered died in less than six months. Dr. Turner has pointed out that the bilharzia pulmonary lesions probably predispose the natives to tubercle. Cancer was the cause of 48 deaths among the natives, the liver and stomach being most commonly attacked. Syphilis is thought to have been introduced from Kimberley in 1881, and is now widely prevalent amongst the natives of the Transvaal and Bechuanaland. It is believed to be conveyed sometimes by the use of infected knives in the circumcision rite and by the practice in some districts of inoculating the parents with blood when a birth has taken place. White children have been infected through being kissed by syphilitic native nurses, and circulars have been distributed arranging for the free examination of native servants and the free issue of curative medicines by district surgeons. Only three cases of small-pox occurred during the three years, for vaccination of natives is compulsory. Ankylostomiasis is notifiable, but only 15 cases were reported, though the disease is exceedingly prevalent among the natives recruited from the east coast and from the central tropical areas of South Africa. The comparative freedom from ankylostomiasis in miners is probably due to the fact that the Rand mine waters are acid and provide a natural process of disinfection against the larvæ of the worm. 40 lepers, including 3 white women, were notified and were removed to the leper asylum in Pretoria. No case of bubonic plague occurred among men or rats, and 43,098 rats and mice were destroyed with the aid of traps, dogs, and ferrets. There are now 15 registered nursing homes in Johannesburg, all inspected and licensed by the Public Health Department. We cordially congratulate Dr. Porter and his staff upon the excellent work which they are doing, and we hope that the mayor and his municipal colleagues will heed the grave warnings and recommendations of this report.

[1] Report of the Medical Officer of Health on the Public Health and Sanitary Circumstances of Johannesburg during the Triennium, July 1st, 1906, to June 30th, 1909. By C. Porter, M.D., D.P.H., Johannesburg, February, 1910. Pp. 68.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 77 of the largest English towns 8350 births and 3588 deaths were registered during the week ending July 2nd. The annual rate of mortality in these towns, which had been so low as 11·1 and 11·2 per 1000 in the two preceding weeks, further declined to 11·0 in the week under notice. During the 13 weeks of the past quarter the annual death-rate in these towns averaged only 12·7 per 1000, and was 1·6 below the mean rate in these towns in the four preceding corresponding quarters. In London during the same period the death-rate, calculated on the estimated population, did not exceed 12·2 per 1000. The lowest reported annual rates of mortality during last week in these 77 towns were 3·7 in East Ham, and 6·3 in Willesden and in Hornsey; the rates in the rest of the 77 towns ranged upwards to 17·1 in Huddersfield, 18·1 in Oldham, 19·2 in Warrington, and 21·3 in Tynemouth. In London the reported death-rate last week was only 10·3 per 1000. The 3588 deaths registered last week in the 77 towns showed a decline of 45 from the number in the previous week, and included 336 which were referred to the principal epidemic diseases, against numbers declining from 425 to 353 in the five preceding weeks; of these 336 deaths, 113 resulted from measles, 110 from whooping-cough, 55 from diarrhœa, 25 diphtheria, 20 from scarlet fever, and 13 from enteric fever, but not one from small-pox. The mean annual rate of mortality from these epidemic diseases in the 77 towns last week was equal to 1·0 per 1000, against 1·1 in each of the two preceding weeks. No death from any of these epidemic diseases was registered last week in Croydon, East Ham, Walthamstow, Derby, or in 14 other smaller towns; the annual death-rates therefrom ranged upwards, however, to 2·8 in Grimsby and in Warrington, 2·9 in Oldham, 3·0 in Stockport, and 3·3 in Barrow-in-Furness. The fatal cases of measles in the 77 towns, which had been 149, 106, and 94 in the three preceding weeks, rose again to 113 last week; the highest annual rates from this disease last week were 1·7 in Preston, 1·8 in Oldham, 2·0 in Merthyr Tydfil, and 3·3 in Barrow-in-Furness. The 110 deaths from whooping-cough showed a decline of 24 from the number in the previous week, but caused rates equal to 1·4 in Ipswich, 1·5 in Stockport and in Bootle, and 2·1 in Warrington. The deaths attributed to diarrhœa, which had been 75 and 70 in the two previous weeks, further declined under the influence of lower temperature to 55; the deaths from this cause were proportionately most numerous in Grimsby. The 25 fatal cases of diphtheria showed an increase of 8 upon the low number in the previous week, and included 7 in London and its suburban districts, and 2 each in Liverpool and Manchester. The fatal cases of scarlet fever, which had been 22 and 25 in the two preceding weeks, declined to 20 last week, of which 4

occurred in Manchester and Salford, and 2 both in Portsmouth and Liverpool. The 13 deaths referred to enteric fever corresponded with the number in the previous week; they included 2 in London. The number of scarlet fever patients under treatment in the Metropolitan Asylums and in the London Fever Hospital, which had steadily declined during the past six months to 1353 in the previous week, had risen to 1387 at the end of last week; 183 new cases of this disease were admitted to these hospitals during last week, against 166 and 187 in the two preceding weeks. The Metropolitan Asylums hospitals contained only 1 case of small-pox on Saturday last. Of the 964 deaths registered in London during last week 122 were referred to pneumonia and other diseases of the respiratory system, and were 20 below the corrected average number in the corresponding week of the five years 1905–09. The causes of 31, or 0·9 per cent., of the deaths registered during the week were not certified either by a registered medical practitioner or by a coroner. All the causes of death registered during the week were duly certified in Leeds, Bristol, West Ham, Nottingham, Leicester, Salford, and in 47 other smaller towns; the 31 uncertified causes of death in the 77 towns last week included 4 in Manchester, and 2 each in Sheffield, Norwich, Warrington, Gateshead, Stoke-on-Trent, and London.

HEALTH OF SCOTCH TOWNS.

In eight of the principal Scotch towns 936 births and 477 deaths were registered during the week ending July 2nd. The annual rate of mortality in these towns, which had declined in the four preceding weeks from 14·3 to 13·3 per 1000, further declined to 13·2 in the week under notice. During the 13 weeks of the past quarter the death-rate in these towns averaged 15·4 per 1000, and exceeded by 2·7 the mean rate during the same period in the 77 largest English towns. The annual death-rates last week in these eight Scotch towns ranged from 10·1 and 11·7 in Aberdeen and Edinburgh, to 14·4 in Leith and 22·1 in Dundee. The 477 deaths from all causes in the eight towns during last week showed a further decline of 7 from the numbers in recent weeks, and included 48 which were referred to the principal epidemic diseases, against 42 and 61 in the two preceding weeks; of these 48 deaths, 17 resulted from diarrhœa, 12 from whooping-cough, 9 from measles, 5 from diphtheria, 4 from scarlet fever, and 1 from "fever," but not one from small-pox. The mean annual rate of mortality from these epidemic diseases in the eight towns last week was equal to 1·3 per 1000, against 1·0 in the 77 English towns; the highest rates from these diseases in the Scotch towns last week were 2·8 in Paisley and 3·4 in Dundee. The 17 deaths attributed to diarrhœa in the eight towns last week corresponded with the number in the previous week, and included 10 in Glasgow, 3 in Edinburgh, and 2 in Paisley. The 12 fatal cases of whooping-cough showed a further slight increase upon recent weekly numbers; 5 occurred in Glasgow and 4 in Dundee. The deaths from measles, which had been 15 and 12 in the two preceding weeks, further declined to 9 last week, including 5 in Dundee and 2 in Paisley. The fatal cases both of scarlet fever and diphtheria showed a decline from the numbers in the previous week; 2 deaths from each disease were returned in Glasgow. The 1 death referred to "fever" in the eight towns occurred in Glasgow, and was certified as cerebro-spinal meningitis. The deaths referred to diseases of the respiratory system in the eight towns, which had been 56 and 61 in the two preceding weeks, declined to 55 in the week under notice, and were 16 below the number in the corresponding week of last year. The causes of 13, or 2·7 per cent., of the deaths in the eight towns last week were not certified or not stated; in the 77 English towns the proportion of uncertified causes of death last week did not exceed 0·9 per cent.

HEALTH OF IRISH TOWNS.

In 22 town districts of Ireland, having an estimated population of 1,151,790 persons, 665 births and 355 deaths were registered during the week ending July 2nd. The mean annual rate of mortality in these towns, which had been equal to 18·9 and 17·9 per 1000 in the two preceding weeks, further declined to 16·1 in the week under notice. During the 13 weeks of the past quarter the annual death-rate in these Irish towns averaged 20·1 per 1000, whereas the mean rate during the same period did not exceed 12·7 in the 77 largest English towns and 15·4 in the eight principal Scotch towns. The annual death-rate during last week was equal to 15·3 in Dublin, 18·3 in Belfast, 17·8 in Cork, 7·2 in Londonderry, 20·5 in Limerick, and 15·6 in Waterford; the mean annual death-rate last week in the 16 smallest of these Irish towns was equal to 13·9 per 1000. The 355 deaths from all causes in the 22 town districts last week showed a further decline of 41 from the numbers in recent weeks, and included 39 which were referred to the principal epidemic diseases, against 68 and 50 in the two preceding weeks; these 39 deaths in the Irish towns were equal to a mean annual rate of 1·8 per 1000, while in Belfast it was equal to 3·7; in the 77 English towns the mean rate last week from the same diseases did not exceed 1·0, and in the eight Scotch towns it was 1·3. The 39 deaths from these epidemic diseases in the Irish towns last week included 26 from measles, 6 from whooping-cough, 3 from diarrhœa, 2 from diphtheria, and 1 each from scarlet fever and enteric fever, but not one from small-pox. The fatal cases of measles in the 22 towns, which had been 52 and 39 in the two preceding weeks, further declined last week to 26, of which 25 occurred in Belfast. The 6 deaths from whooping-cough included 3 in Dublin. The fatal case of scarlet fever and one of the 2 deaths from diphtheria occurred in Dublin; and the death referred to enteric fever was registered in Belfast. The deaths in the 22 towns referred to pneumonia and to other diseases of the respiratory system, which had been 62 and 72 in the two preceding weeks, declined last week to 43. The causes of 20, or 5·6 per cent., of the deaths registered in the Irish towns last week were not certified; in the 77 English towns the proportion of uncertified causes of death last week did not exceed 0·9 per cent., and in the eight principal Scotch towns it was equal to 2·7 per cent.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointment is notified:—Staff-Surgeon: S. Croneen to the *Bulwark*, temporary, for manœuvres.

ROYAL ARMY MEDICAL CORPS.

Colonel M. W. Kerin, C.B., from Lucknow, has joined at Naini Tal. Lieutenant-Colonel H. J. Fletcher has been transferred from Rawalpindi to the Station Hospital at Sialkot. Lieutenant-Colonel F. W. C. Jones, from Tidworth, has been selected to take charge of a camp of instruction for Royal Army Medical Corps *personnel* at Salisbury Plain. Lieutenant-Colonel M. O'Halloran, from Brighton, has been posted to Shorncliffe. Lieutenant-Colonel J. H. Daly, from Tipperary, has been appointed to command the Station Hospital at Dalhousie. Lieutenant-Colonel H. Cocks has been posted to Woolwich. Lieutenant-Colonel R. W. Wright has taken over medical charge of troops at Shoeburyness. Major B. Ford has joined at Wynberg. Major J. D. Ferguson, D.S.O., has been transferred from Aldershot to London. Major John M. Buist has been posted to the Royal Victoria Hospital at Netley. Major J. F. M. Kelly has been posted to Potchefstroom. Major A. J. Chambers has joined at Pretoria. Major H. W. K. Read has been transferred from Beverley to Pontefract. Major F. J. Wade-Brown has joined at Tipperary. Major C. T. Samman, from Shorncliffe, has been posted to Dinapore. Major G. J. Buchanan has been transferred from Bareilly to Chaubuttia for duty during the summer months. Major E. M. Williams has been posted to Calcutta. Captain H. M. Morton has joined at Potchefstroom. Captain J. Matthews has been posted to Karachi. Captain R. L. Argles has been transferred from Ferozopore to Solon. Captain R. J. Cahill, in charge of the Brigade Laboratory, Madras, has been appointed a Specialist in the Prevention of Disease to the Madras Brigade.

INDIAN MEDICAL SERVICE.

The King has approved of the retirement of the undermentioned officer: Lieutenant-Colonel Richard James (dated April 29th, 1910).

Lieutenant-Colonel G. J. H. Bell, Superintendent of the Central Jail at Rangoon, has been selected for the appointment of Inspector-General of Prisons, Burma, in place of Lieutenant-Colonel E. P. Frenchman, retired. Lieutenant-Colonel D. P. Spencer has received permission to retire from May 16th on completion of 30 years' service. On return from deputation Lieutenant-Colonel J. Crimmin, V.C., C.I.E., has been appointed Presidency Surgeon, Bombay. Lieutenant-Colonel W. E. Jennings has been appointed Health Officer to the Port of Bombay. The services of Lieutenant-Colonel F. C. Reeves have been replaced at the disposal of His Excellency the Commander-in-Chief. Lieutenant-Colonel J. Chaytor-White, Sanitary Commissioner of the United Provinces, has been granted privilege leave, combined with furlough, out of India, on medical certificate for nine months. Lieutenant-Colonel E. C. Hare, Sanitary Commissioner, Assam, has been granted nine months' extension of his leave from India. Lieutenant-Colonels L. F. Childe and A. Coleman have arrived home from India. Major A. Fenton has been transferred from Mogôk and appointed Civil Surgeon, Mandalay. Major H. Ainsworth has been appointed to officiate as Professor of Surgery at the Medical College, Lahore. Major P. S. C. More has taken over the duties of Civil Surgeon, Attock. Major J. W. F. Rait has been selected to succeed Lieutenant-Colonel D. G. Crawford as Civil Surgeon of Hughli. Captain F. T. Thompson has been appointed to the officiating medical charge of the 33rd Punjabis. The services of Captain W. P. G. Williams have been placed at the disposal of the Government of India for civil employment in the Jail Department of Madras. Captain M. J. Quirke has been posted to the Madras Presidency.

TERRITORIAL FORCE.

Royal Army Medical Corps.

Unattached List.—Norman Cecil Rutherford to be Lieutenant, for service with the Medical Unit of the Royal College of Surgeons (Dublin) Contingent, Senior Division, Officers Training Corps (dated June 6th, 1910).

THE NAVAL MEDICAL CONSULTATIVE BOARD.

Inspector-General Howard Todd of the Royal Naval Hospital, Plymouth, has been appointed a member of the Naval Medical Consultative Board.

DEATHS IN THE SERVICES.

Inspector-General Thomas Bolster, R.N. (retired), at his residence, at Devonport, on June 17th, aged 65 years. He entered the Naval Medical Service in 1867, and became staff-surgeon in 1878, fleet-surgeon in 1887, deputy-inspector-general of hospitals in 1896, and inspector-general in May, 1901. He was well-known in Plymouth, and was in charge of the Royal Naval Hospital in that town from August, 1901, to December, 1903, when he retired. He saw no war service.

BRITISH RED CROSS AND TERRITORIAL NURSING NOTES.

A meeting of the advisory committee which has been recently formed for the purpose of facilitating the working of the scheme for organising voluntary aid was held at the War Office on July 1st. The following members were present: Surgeon-General W. L. Gubbins, Director-General Army Medical Service (chairman), Lieutenant-Colonel F. S. Maude, and Lieutenant-Colonel E. Eckersley, representing the War Office; Sir Richard Temple and Colonel R. B. Colvin, representing the Council of County Territorial Associations; Sir Frederick Treves and Mr. A. A. Bowlby, representing the British Red Cross Society; and Colonel Sir George Beatson, representing the St. Andrew Ambulance Association.

The scheme by which the St. John Ambulance Association will aid the Territorial Forces in time of war will include the formation of two classes of local bodies. The St. John Ambulance Brigade Companies will be formed under Brigade Orders and the St. John Ambulance County Companies will be formed by the Territorial branch of the association. In case of war their services will be offered to the War Office.

At a meeting held at 37, Portland-place on June 30th, under the presidency of Lord Aldenham, Mrs. St. Clair Stobart explained the objects of the "Women's Sick and Wounded Convoy Corps." Mrs. Stobart, who is the commandant of the corps, said that it had been organised for the purpose of training women to become efficient members of voluntary aid detachments. A letter from Captain Langford Lloyd, who was unable to be present, stated that detachments trained by the corps would be placed at the disposal of the Red Cross Society for work under the medical department of the army, and that such detachments would be called out for duty whenever the Territorial Army was mobilised for national defence.

The Lady Mayoress, as President of the City of London Branch of the British Red Cross Society, is seeking the assistance of the leading City Guilds in bringing to the notice of employers of labour and the managers of business houses and public institutions the efforts which the branch is making on behalf of the Red Cross Society. It is pointed out that the training involved in the work of the society would make employees not only of use in case of invasion but would enable them to become more useful in their homes and lives generally.

Miss Haldane, addressing the members of the Guild of the Cheltenham Ladies' College at their biennial conference on July 2nd, congratulated the members of the college upon their Red Cross display. The Territorial Nursing Service, she said, was very nearly complete, having 98·5 per cent. of its establishment. The voluntary aid detachments necessary to cope with the work were springing up all over the country. She was glad to see so large a proportion of their college voluntary aid detachment skilled in cooking. The knowledge of nursing and first aid disseminated over the country would be invaluable.

The Countess of March presided at a meeting in support of the British Red Cross Society, which was held at the Corn Exchange, Chichester, on June 30th. Sir Frederick Treves gave an inspiring address, urging the women of the country to take up their share of the work of looking after the sick and wounded who might fall in our own land.

Under the presidency of the Countess Fortescue a meeting was held at Crediton on June 29th for the purposing of forming a branch of the Red Cross Society for that town.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

A long instalment of Lieutenant-Colonel R. J. Simpson's medical history of the South African war, dealing with continued fevers and bowel complaints, appears in the July issue of this journal, and Captain L. W. Harrison concludes his article on the Serum Diagnosis of Syphilis. Among other articles of interest may be mentioned that on Mediterranean Fever in Gibraltar in 1909, by Major C. E. P. Fowler, and Some Hints on Staff Tours, by Major W. T. Mould. The improvisation of means for carrying the injured is always an attractive subject. Especially is this so at the present moment when so much is being done to interest the country in national defence, and an article on the Adaptation of a Motor Omnibus and Scotch Hay-cart for the Carriage of Wounded Men, by Lieutenant-Colonel H. E. R. James, will be found to be a practical contribution to the subject. The unadapted motor omnibus is not convenient for carrying more than one patient with any degree of comfort, but with slight alterations and the addition of wooden bars and stretchers the vehicle becomes on good roads an excellent ambulance carriage. Similarly the Scotch hay-cart can be converted into a very useful ambulance wagon. Among the clinical notes is an analysis of 500 cases of syphilis by Captain A. D. Jameson, the author's conclusions being that treatment by intramuscular injections of metallic mercury is distinctly satisfactory.

ANTI-TUBERCULOSIS CAMPAIGN AT BATTERSEA.—A public meeting, at which the Mayor of Battersea will preside, is to be held in the Town Hall, Battersea, on Wednesday, July 13th, at 8.30 P.M., to discuss a proposal to establish a dispensary for the treatment and prevention of consumption. Speeches will be made by Dr. J. J. Perkins, honorary secretary, National Association for the Prevention of Consumption; Dr. D. J. Williamson, medical officer of the Paddington Dispensary for Prevention of Consumption; and Miss McGaw, honorary secretary to the same. The proposal for a dispensary originates from the Battersea Voluntary Health Society, an organisation which has as its objects the reduction of infantile mortality and the prevention of the spread of tuberculosis. We refer our readers who are particularly interested in this branch of medical and social organisation to the account of the work of the Paddington Dispensary published in THE LANCET of March 26th, 1910 (p. 876) and to our leading article on the subject in the same issue.

Correspondence.

"Audi alteram partem."

A STEAMER WITH SPECIAL MOSQUITO SCREENS.

To the Editor of THE LANCET.

SIR,—A short account of an inspection of a steamer which has been especially screened against mosquitoes may prove of interest to those of your readers whose work lies in the tropics. Sailing up the Amazon when the ship hugs the banks to avoid the current, mosquitoes will often fly abroad in swarms and cause much discomfort to those on the boat. In malarious regions infected anophelines will come from the shore and an outbreak of malaria may occur. Many of the steamers on the Rio Madeiro have had nearly the whole crew laid up with fever. The Booth Steamship Company has just despatched a small freight boat on her maiden trip to that river which has been specially designed to meet this evil. It was suggested to the company that the members of the Medical Advisory Board of the African Committee of the Colonial Office would like to make an inspection of this new experiment. Accordingly, Sir Rubert Boyce, Professor W. J. Simpson, Dr. J. K. Fowler, and Dr. W. T. Prout, as representing the Advisory Board, and Professor R. Ross, Mr. R. Newstead, Dr. D. Thomson, and the writer, from the Liverpool School of Tropical Medicine, were invited to pay a visit to the s.s. *Vincent* on May 6th last.

The steamer is designed purely for cargo, which she carries direct from Liverpool to Porto Velho, a small place some 600 miles up the Rio Madeiro, a tributary of the Amazon. The screening was carried out from plans by Dr. Melville Davidson, the medical superintendent of the company. The screening of the ship is so arranged that the living quarters of the crew and officers are protected from mosquitoes. Each port-hole is provided with a moveable screened frame which is so adapted that the port-hole can be closed and screwed down without withdrawing the screen. The entrances to the main deck are protected by wire gauze spring doors, and at each side of the ash-shoot, which is of necessity open to the ingress of mosquitoes, extra sets of screened doors are placed. The doors and port-holes of the outside bridge deck cabins are also screened; the doctor's quarters and the hospital are situated further aft and are thoroughly screened.

The interior arrangements permit of no old-fashioned water reservoir over the wash-basin in the cabins, and running water is supplied everywhere. The slops from the basins run into pipes emptying directly over the side. This arrangement very satisfactorily deprives the stegomyia larvæ of breeding places in the cabins. The ventilator pipes in the cabins and along the alleyways are each protected by a wire gauze screened frame, which slips into a grooved moulding fixed round the shaft, and is kept in place by three small buttons. The screening is composed of 18 mesh phosphor-bronze wire, a material which is more suitable for a moist humid climate than brass or copper. Some idea of the completeness of the screening can be gathered from the fact that 18 doors and 49 port-holes require to be screened.

Nearly two hours was spent in examining the vessel, and it was considered by all that this was a distinct advance in the construction of ships plying in tropical waters. Only those of us who have had opportunities for observing the accommodation provided for the crew on an ordinary steamer despatched to the tropics can realise the importance of these new improvements. The protection afforded against mosquitoes and insects of every kind, the removal of the necessity to use a mosquito-net in a stuffy cabin, and the security afforded to the non-immunes who serve on board these vessels amply justify the additional expenditure that the comprehensive system of screening has entailed.

I am, Sir, yours faithfully,

H. WOLFERSTAN THOMAS.

THE TREATMENT OF RINGWORM.

To the Editor of THE LANCET.

SIR,—From time to time in your pages the treatment of ringworm is discussed. The action of radium emanations, various forms of electrical energy, &c., have been recommended.

For many years it is my custom to treat ringworm in a method I have not seen mentioned. It consists of painting with a soft camel-hair brush the area of skin affected with the ordinary 40 per cent. solution of formalin, meanwhile keeping the patch of skin in such a position that the solution will not run off it.

If the skin is greasy it should be washed with spirit and allowed to dry before applying the formalin. As a rule one painting is sufficient to effect a cure, but if one is in doubt the painting can be repeated in about five days. Young patients sometimes complain of the smarting, and the skin scales from the irritating action of the drug. Notwithstanding these drawbacks, the drug is rapid, clean, and effective in its action in this disease.

I am, Sir, yours faithfully,

J. MACKINNON, M.B. Edin.

Somerset East, Cape Colony, May 22nd, 1910.

A PRELIMINARY NOTE ON THE TREATMENT OF RODENT ULCER BY SOLID CARBON DIOXIDE.

To the Editor of THE LANCET.

SIR,—In a previous paper[1] I stated that I thought solid CO_2 should give good results in the treatment of rodent ulcer, but that I would prefer to begin on a simple uncomplicated case and not too near the eye, nose, or mouth. Since that time I have had opportunity to try the method in three such cases, and in all of them the result has been entirely satisfactory up to the time of writing. Two of them were situated just above the zygomatic arch, and the third one on the cheek just over the malar bone. They were all chosen from their being simple but typical ulcers of their kind and about which there could be no doubt as to their nature.

The procedure was in all cases the same. I first scraped away all the granulation tissue until a firm but raw surface was left. I then trimmed a carbon dioxide crayon to the shape of the ulcer but a little larger in size, as I considered it advisable to include a small amount of the healthy margin in the reaction. The crayon was now applied with firm pressure for 40 seconds. A very lively reaction followed with exudation. This was dressed with boric acid ointment, and when seen a week later the appearances were those of an ordinary healthy healing sore, which skinned over rapidly without any unusual features. The first one treated has now been well for just over three months. The scar is soft and elastic, almost the same colour as the surrounding skin, and so slightly depressed as to be unnoticeable except to the practised eye.

I, of course, do not pretend for a moment that I have discovered the ideal treatment for this disease. The facts serve to corroborate my theory that the reaction following the application of solid carbon dioxide should be sufficient to cause the immediate disappearance of a simple uncomplicated case of rodent ulcer. The subsequent healing process was at least as rapid as that following the application of zinc ions, and I firmly believe that the effect will be found to be more far-reaching and complete, as well as less likely to be followed by recurrence. This latter is one of the objections to the ionic method, and is no doubt due to the fact that the ions can penetrate such a very short distance into the tissues. In due time we shall know how permanent a cure by this method will be. Personally, I have little doubt as to the result, and that it will be found as reliable as any other method at our disposal. The advantages are very great and obvious: in simple cases, at least, a very short and nearly painless application, a brief and almost painless reaction, and the place healed up in from ten days to a fortnight. I feel confident that this is a disease where we shall be able to dispense with that very expensive and slow-acting substance, radium; this is very important, as not everybody can afford the time and the money to indulge in this, the greatest luxury of modern medicine.

I am continuing my investigations in this direction and applying it to the less simple cases. The results will be reported in due course.

I am, Sir, yours faithfully,

REGINALD MORTON.

Upper Wimpole-street, W., July 5th, 1910.

[1] THE LANCET, Dec. 4th, 1909.

THE MEDICAL LIBRARY ASSOCIATION.

To the Editor of THE LANCET.

SIR,—By the kind permission of the British Medical Association, the second annual meeting of the Medical Library Association, under the presidency of Professor W. Osler, will be held at London University during the last week in July. Two short sessions will be held on the mornings of July 27th and 28th, at which papers will be read dealing with matters likely to be of practical interest and assistance to medical librarians, members of library committees, and readers.

It is also intended to hold a bibliographical exhibition in connexion with the meeting, as this proved such a successful feature of the meeting held in Belfast last year, and we shall be glad to receive offers of loans to illustrate the following sections of the exhibition.

1. Incunabula.
2. Books by London medical men up to 1600.
3. Photographs of, and papers relating to, medical libraries.
4. Special collections, &c.

We are, Sir, yours faithfully,

I. WALKER HALL, M.D. Vict., Pathological Department, University of Bristol;
CUTHBERT E. A. CLAYTON, Medical Library, University of Manchester.
} Joint Hon. Secretaries.

CORK QUEEN'S COLLEGE AND THE NATIONAL UNIVERSITY OF IRELAND.

To the Editor of THE LANCET.

SIR,—Many old students of the Cork Queen's College will, I am sure, be anxious to know how their *alma mater* is affected by recent university legislation, and with your permission I propose giving them a few particulars.

The Irish Universities Act (1908) has produced many changes in the constitution of the Cork Queen's College. With its name altered to University College it has become one of the three constituent colleges of the National University, and is to a great extent autonomous. The number of professors and lecturers have been considerably increased, especially at the arts side. The courses of study for the medical faculty have been considerably altered. The more important alterations will be best understood by a comparison with the late Royal University. At the Royal the medical undergraduate was obliged to pass the first arts examination. This is not required by the National University, the idea being that the matriculation examination should be sufficiently stiff to ensure that the medical student's general education has been such as would enable him to pursue his medical studies with advantage. At the Royal there were three examinations. At the National there are four. Under the new system the student gets done with such subjects as chemistry and anatomy by the end of his second year. At the end of his fourth year he is examined in pathology, public health, therapeutics, &c., and at the final examination he concentrates all his energies on medicine, midwifery, and surgery, including ophthalmic surgery. This seems a distinct improvement, as at the Royal final the student had to deal not alone with these three subjects, but also with a number of others less important.

The methods of holding the examinations are also a distinct advantage to Cork students who are now examined locally and not put to the expense, as formerly, of being obliged to proceed to Dublin. At the Royal examinations they were generally confronted by strange examiners about whose "idiosyncrasies" they knew nothing, whilst Dublin students with whom they had to compete were not similarly handicapped. Now they are examined by their own professors and lecturers, with whom are associated extern examiners. As the same pertains in the three colleges it is a case of a fair field where the best men will be the first to pass the winning post. At the M.B. examination recently held in Cork six out of nine candidates were successful, and of the latter one was awarded first honours and two secured second honours. There was only one candidate, Dr. J. J. Kearney, for the M.D. degree. He holds a dispensary appointment in a country district remote from centres of education. He had been a distinguished student of the Cork College. Not only has he succeeded in obtaining his M.D. degree with first-class honours, but on the strong recommendation of the Board of Examiners he has been awarded a gold medal by the University for his meritorious answering.

The President, Dr. B. C. A. Windle, acting as Pro-Vice-Chancellor of the University, alluding to the successes of the Cork College at the latest conferring of degrees,[1] strongly urged that Cork should have a university of its own, and said that the fact of the Cork College being anchored to the National University resulted in some very tangible disadvantages. For instance, during the session all the professors and lecturers are obliged to proceed to Dublin to attend the annual meeting of Faculties, and those of them who are members of the Board of Studies may have to make sundry journeyings of the kind. That must mean for some members of the collegiate medical staff considerable interference with their private practice, and it is said hotel and travelling expenses which are borne by the National University will amount to £500 a year, a goodly sum which could be saved and devoted to more useful purposes if a Cork University were established.

I am, Sir, yours faithfully,

Cork, July 1st, 1910. M.D.

Looking Back.

FROM

THE LANCET, *SATURDAY*, July 7th, 1832.

DISCOVERY OF

AIR IN THE HEART,

AFTER VENOUS INJECTION.

To the Editor of THE LANCET.

SIR,—The interest excited by the experiments performed in London, of the introduction of saline substances in the fluid state into the blood of patients labouring under cholera, has not been lessened by the result of the trials recently made by Dr. Venables, and other practitioners, without success. The post-mortem appearances in two individuals treated in this manner under the superintendence of Dr. Venables, have been fully detailed in the last number of THE LANCET. In both, *air* was found in some quantity in the cavities of the heart. This circumstance has been supposed by many to account in a satisfactory manner for the patient's death, but I have been assured by Dr. Venables, (and I can place full reliance on his capacity for conducting the operation, and the veracity of his report,) that every care was taken to exclude the access of atmospheric air, not a particle of which was introduced in the course of the operation. That, however, air may be generated spontaneously in the heart, was proved to me yesterday while examining the body of a cholera patient. Mrs. R., the wife of a man in poor circumstances, died of this disease on Sunday last, July 1st, after twelve hours illness. On the following Wednesday, at noon, I assisted my friend, Dr. Hingeston, of the South London Infirmary, in inspecting the body. The general anatomical appearances were those which I have invariably found, but the contents of the stomach and intestines were acid (the woman had been strongly purged). The heart was soft and distended, and when a puncture was made into it, a good deal of air escaped, followed by fluid blood mixed with bubbles of air. The treatment consisted in the exhibition of calomel, Cayenne pepper, and other stimulants in a fluid form. I do not remember to have seen so great a quantity of air in the heart so soon after death in any other instance. I submit the question whether the peculiar condition of the blood could have influenced this early separation of gas in the case of this woman.

I am, Sir,

Your obedient servant,

P. H. GREEN.

July 4th, 1832.

[1] THE LANCET, June 4th, 1910, p. 1578.

BRISTOL AND THE WESTERN COUNTIES.

(FROM OUR OWN CORRESPONDENTS.)

King George V. and the University of Bristol.

THE youngest of English Universities, the University of Bristol, was honoured by inclusion in the group of eight whose addresses were received by the King recently. Of the deputation that waited on His Majesty, three were presented to him: two Pro-Chancellors, the Right Hon. Henry Hobhouse and the Right Hon. Lewis Fry, and the Vice-Chancellor, Sir Isambard Owen.

City Scholarships for the University of Bristol.

A report drawn up by a joint committee of the University Council and the Bristol Education Committee was laid before the latter body at a recent meeting. It recommends the formation of a standing committee composed of representatives of the Education Committee and of the University Council, the Vice-Chancellor to be chairman and convener with a casting vote, to meet in the University, the registrar of the University acting as secretary. They shall administer the funds placed at their disposal by the city council (about £3000 per annum) to provide university education for Bristolians who would otherwise be deprived of its benefits, subject to certain conditions. The money may be spent in grants for wholly or partially free education in the University, in grants for the maintenance of students, for the purchase of books, &c.; it shall be spent for women as well as for men, for graduates as well as for undergraduates, and preference is to be given to persons who have been pupils of a public elementary school for not less than three years. These disbursements are to be subjected annually to examination by the Education Committee, and grants may be discontinued if the recipient's conduct or progress be deemed unsatisfactory.

Winsley Sanatorium.

At a recent meeting of the board of management, Dr. R. Shingleton Smith, who was in the chair, said that the mortgage debt had been reduced to £8550. A bequest of £500 from the late Mr. Alfred Shipley is to be devoted to its further reduction. The question of the medical officer's quarters came under discussion in connexion with certain donations offered for the specific purpose of building a house for the medical officer away from the general building; but the board decided that all further developments ought to be postponed till the existing debt was wiped out.

The Death Certificates of Parish Patients.

The St. Thomas's (Exeter) board of guardians recently supported a resolution suggesting that the description "pauper" should be removed from the death certificates of cases dying when under the Poor-law. At its meeting held on July 1st it was reported that four local Members of Parliament who had been approached upon the subject were all in favour of the suggestion.

The Proposed New Sanitary Area for Devonshire.

The Local Government Board has been recently making inquiries in connexion with the proposed new sanitary area for East Devon. The districts involved are the borough of Honiton, the urban districts of Ottery St. Mary, Seaton, and Sidmouth, and the rural districts of Honiton and Axminster. It is proposed to have a whole-time medical officer of health with a salary of £600 per annum, and to erect an isolation hospital for 35 beds. The cost of the building would be about £13,000. The majority of the councils seem to favour the scheme, although, unfortunately, some only wish for a portion. For example, the Axminster rural district council at its last meeting decided to inform the Local Government Board that it was in favour of a whole-time medical officer of health, but, owing to the small amount of infectious diseases, it objected to the proposed isolation hospital. The Axminster rural district council should remember that perhaps in the future it may have some epidemic when it may require isolation accommodation.

Sanitation in Cornwall.

At a recent meeting of the Liskeard district council the medical officer of health (Mr. W. Nettle) reported two cases of scarlet fever occurring in a house at Polperro. Ten people lived in the house, six sleeping in one room and four in another. Mr. Nettle stated that this case showed the need of an isolation hospital. The medical officer of health reported the result of a house-to-house visitation he had made on the Lansallos side of Polperro. He stated that he had only had two cases of enteric fever in Polperro during his term of office, and added that nine-tenths of the houses did not appear to have an inch of ground to spare. Mr. Nettle also reported on the insanitary condition of several houses at St. Ive Cross, which in their present state were unfit for human habitation, water streaming into the bedrooms through defective roofs and ceilings. The inspector stated that the well at St. Ive Cross was almost a receptacle for sewage.

July 5th.

BIRMINGHAM.

(FROM OUR OWN CORRESPONDENT.)

The Hospital for Sick Children.

THE fund being raised by the *Birmingham Daily Mail* for a memorial to His late Majesty King Edward VII. has already met with considerable success. It is definitely decided to erect a statue of the late King and as a further memorial to raise a fund in aid of the rebuilding of the Children's Hospital. It is estimated that a statue would cost about £1500, and for the hospital a sum of £50,000 is required. An organised canvass of the city and suburbs has been arranged, and collections are being made among manufacturers, tradesmen, and workpeople. So far more than £12,000 have been received.

Special Schools and After-care.

The report of the special schools subcommittee presented to the Birmingham education committee by Mrs. Pinsent on June 24th contains an interesting annual report of the special schools after-care subcommittee. Through the kindness of the committee of the Blind Institution an account of the after-care of blind children was obtained. A large number are employed in the workshops of the Blind Institution after they have completed their training. This institution has recognised that defectives however well trained could never compete in the open market with normal persons, and their pioneer work in supporting their own workshops has met with great success. The report strongly suggests that organised workshops where defective children could continue work after they had left school would be of real use. Of children who had been in cripple schools it was found that only 30 per cent. were earning wages at all, and the very small wages earned suggested that something should be done towards improving the conditions under which they worked. Deafness seemed to be the least incapacitating defect, for it was found that 61 per cent. were earning wages, 31 per cent. were earning over 10*s.* a week, and in one case the wages were 32*s.* 6*d.* But there were a certain number who found it difficult to get employment, and for these an organised workshop would be useful. The problem of the mentally defective was much more serious. The number being trained this year reached 900, while the number of deaf children was 80, of cripples 220, and of the blind 40. Out of 316 feeble-minded persons who have left school and whose whereabouts are known, only 36·0 per cent. are earning wages at all, only 6·6 per cent. are earning as much as 10*s.* per week, and less than 1 per cent. are earning 15*s.* per week. There is proof that those lost sight of belong to a class who rarely become wage-earners. The after-care subcommittee, therefore, after nine years' experience with defectives, again repeats its conviction that for a large number of the feeble-minded permanent care and control are necessary for the following reasons: (1) To enable them to contribute towards their own support; (2) to save them from harsh treatment at home and in the streets; (3) to prevent them becoming drunkards, criminals, and prostitutes; and (4) to prevent their giving birth to children who must almost certainly grow up to be a burden to the community. The following resolution was passed by the education committee on the adoption of the report:—

That a copy of the report be forwarded to the Prime Minister with the following memorandum—namely: The education committee of the city of Birmingham, having had experience of the working of special schools for mentally defective children, and being convinced

that such persons cannot be withdrawn from public control at the age of 16 years without grave danger and injury to the national welfare, earnestly hope His Majesty's Government will at the earliest possible time introduce legislation in accordance with the recommendations of the Royal Commission on the Care and Control of the Feeble-minded.

Open-air School.

At the same meeting of the education committee a letter was read from Mr. and Mrs. Barrow Cadbury generously offering the free use of a field of five acres near King's Heath for use as an open-air school. The field is 500 feet above sea level and has an open view and good trees for shade. It is near a tram route and easily accessible. Mr. and Mrs. Cadbury also offered to contribute £400 to cover the cost of equipment, and will place at the disposal of the committee a large airy room at Uffculme during the winter months and also the use of the grounds of Uffculme during the summer when not required for parties. The beautiful house and grounds of Uffculme, formerly the residence of the late Richard Cadbury, are now used by the Adult School Union as a hostel and for meetings. The scheme owes its initiation to lectures recently given by Dr. G. A. Auden, who has closely studied the work of open-air schools in Germany and in this country.

The Health of Handsworth.

The annual report of Dr. W. Sisam, medical officer of health, states that the most noteworthy statistical features are the fall in the birth-rate, the satisfactory general death-rate, which exceeds by a small fraction the lowest recorded in the district, and the equally satisfactory infantile mortality figure. The zymotic death-rate, although somewhat higher than that of last year, is well below the average of the preceding ten years, in spite of a severe epidemic of measles and unusual prevalence of scarlet fever and diphtheria. The population at the middle of last year was 71,935, giving a density of 19·61 per acre. The number of births was 1446, equal to a rate of 20·1 per 1000, compared with 22·2 last year. The deaths numbered 737, giving a rate of 10·2, compared with 10·8 last year. 121 deaths of infants under one year occurred, giving an infantile mortality rate of 83, compared with 90 in 1908. Dealing at some length with the milk-supply, Dr. Sisam points out that between 500 and 600 gallons of milk per day are brought to railway stations from the country. An extraordinary lack of care is found. The churns are left on platforms without being locked or securely fastened in any way. There are thus many possibilities of pollution. The milk churns appear to be sent back without being washed. A very large quantity of milk is brought in by local purveyors. Their churns are frequently left at street corners and other places, and here, again, the lids are not securely fastened.

Sweating in Bakeries.

The Birmingham Trades Council has just issued in pamphlet form a report of its inquiry into the conditions of labour in local bakehouses. The evidence obtained proves beyond question that a serious state of affairs exists. The committee of inquiry was much impressed by the marks of exhaustion and ill-health which distinguished many of the witnesses. There can be no doubt that bread is produced in places and surroundings quite unsuitable for such a purpose, the sanitary arrangements of many bakeries leaving much to be desired. This is especially the case in small old-fashioned bakehouses. There is a consensus of opinion that "draw-plate ovens" are physically injurious to the operatives, the heat arising from them affecting the eyes of men working over them. The large number of small bakers forms the chief obstacle to any voluntary general agreement as to hours, wages, and conditions of labour. The committee was forced to the conclusion that only by scheduling the industry under the Wages Board Act, 1909, can any permanent improvement be effected. The secretary of the Operative Bakers' Union stated that 80 per cent. of the men work from 70 to 84 hours per week. Another 10 per cent. work even more—approaching 100 hours per week. The pace at which the work must be done has increased enormously since the introduction of machinery. There seem to be no fixed meal times; in many cases the men eat their food as they work, even on Saturdays, when from 16 to 22 hours is the usual day's work.

July 5th.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

The University of Liverpool: New Professor of Inorganic Chemistry.

THE Council of the University has recently appointed Mr. E. C. C. Baly, F.R.S., to the Grant chair of Inorganic Chemistry, rendered vacant through the death of Professor J. Campbell Brown. Mr. Baly was educated at University College, London, and is a Fellow of the Institute of Chemistry. In 1889 he was appointed assistant professor at University College under Sir William Ramsay, and received his Fellowship of the Royal Society in 1909. In 1903 Mr. Baly was appointed lecturer in spectroscopy at University College, a post he has held ever since. He has had a wide teaching experience, and has carried out much valuable research work. He has published many scientific papers, and has a great reputation as an investigator.

The Mary Kingsley Medal.

Mr. W. H. Lever, the chairman of the School of Tropical Medicine, entertained on June 25th at the Adelphi Hotel, Liverpool, some of the recipients of the Mary Kingsley Medal and the Society of Tropical Medicine and Hygiene. It will be within the recollection of all those interested in the study of tropical medicine that the Mary Kingsley Medal for Tropical Medicine was instituted in connexion with the great work that intrepid explorer accomplished in the tropics, especially in West Africa, before her untimely death and burial at sea off South Africa. The medal, which is of bronze, is a very handsome work of art, and consists of an artistic portrait of Miss Kingsley; on the reverse side is an allegorical tropical picture with the motto "Devotion to Science." The recipients of the medal are divided into two classes, those called "honorary recipients" and "recipients." Surgeon-General Sir Alfred Keogh, who was present as one of the guests, said his special mission was to endeavour to bring into the councils of the War Office a realisation of the fact that medicine was an applied science, and that it was not concerned merely with the treatment of disease, but its prevention. Sir David Bruce, Professor Ronald Ross, and Dr. F. M. Sandwith also addressed the assembly. By a rule of the school, those directly connected with the school are not eligible for presentation of the medal.

The Liverpool Tuberculosis Exhibition.

The Tuberculosis Exhibition held in St. Martin's Hall was brought to a close on June 25th, the final lecture being delivered by Dr. E. W. Hope, the medical officer of health. Alderman Menlove, the chairman of the health committee of the city council, presided, and there was a crowded attendance. Dr. Hope's lecture was illustrated by limelight views. He emphasised the importance of ventilation and change of air in rooms. In referring to the decline of the death-rate from tuberculosis he pointed out that females had mostly benefited in Liverpool. The female rate of mortality from that disease had declined very much faster than the male. The women had benefited from the improvement in the dwellings. The results of the fight against tuberculosis were encouraging, and he hoped that they would all continue to persevere in their efforts. The chairman, who cordially thanked Dr. Hope for his lecture, said he was greatly interested in the fact that such large numbers of people had attended the exhibition and lectures. Good work had been done. He wanted to do the best he could for the British working men, because they were the backbone of their country. Dr. Hope's heart and soul were in his work. The number of people attending the lectures had been over 12,000. This showed that they had been a success, and he hoped all had gained some information as to the means of promoting health and happiness amongst themselves. 36,000 people had visited the exhibition. He proposed a hearty vote of thanks to Dr. Hope for his interesting and instructive lecture. The motion was seconded by Mr. Anthony Shelmerdine and enthusiastically carried. The ladies, gentlemen, nurses, and others who had assisted in promoting the success of the exhibition were also thanked for their services.

July 5th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Insanitary Houses in Glasgow.

THE chief sanitary inspector of Glasgow, in a statement dealing with insanitary houses in the city, holds the opinion that the general standard of house cleanliness is higher than it was some years ago. Some parts of the city are worse than others in this respect, but an example which the sanitary inspector gives makes one realise the necessity of a regular and systematic house-to-house inspection even in these days of more advanced hygienic ideals. In this case the complaint of a neighbour drew the inspector's attention to a single apartment on the top floor of a three-storey tenement. It was occupied by a single woman, and contained 1330 cubic feet. She worked as a fringer in a fringe- and tassel-maker's warehouse, and over and above her weekly wage her employer permitted her to clean the warehouse and take away any pieces of useless fringing or cotton waste lying on the floors. As a result, it had been for years her custom every night to take a parcel of this waste material to her room and store it there as a standby against the time when she could work no more. By waiting one night until her return from work the inspector was able to obtain a look at the apartment and was astounded to find that it could not be entered except by climbing over a mountain of cotton waste, which filled the whole room from the window to the door, up to within 3 feet of the ceiling. No part of the floor was to be seen. Steps were immediately taken to have the refuse cleared away. The window had to be taken out and the waste thrown out on to the court below. The total weight of the material was 2 tons 15 cwts., and the woman realised £7 7*s.* 9*d.* for the lot. She admitted that she crept over the heap every night and slept in a corner near the window. Buried beneath the heap were found two chairs which constituted the only furniture in the room, and two dead cats, which somehow had found entrance to this strange domicile to die. Apart from any question of sanitation, it is obvious that the whole area was in constant jeopardy from fire. In fact, it is marvellous how it escaped, as here and there, through the heap of combustible refuse, were found loose matches which had not been lighted.

Death of Dr. William Macintosh Gilmour.

The death occurred recently of Dr. William Macintosh Gilmour, one of the best-known medical practitioners in Govan. Born in Glasgow 68 years ago, Dr. Gilmour graduated at Glasgow University, obtaining his degree of M.D. when 23 years of age. A few years later he was appointed Government certifying surgeon for the districts of Govan and Whiteinch, a position which he held for 40 years. Only a few days ago Dr. Gilmour applied for, and obtained, leave of absence for two months, this being the first application he had made during the long period he held his appointment. As a practitioner he was well known and highly esteemed in Glasgow and neighbourhood.

Dundee School Board Medical Officer.

The Dundee school board has appointed Mr. Alexander Edward Kidd, M.B., C.M. Edin., D.P.H., chief medical officer, at a salary of £400 per annum. At present he is medical officer of health of Monifieth and clinical assistant in the Eye Institution, Dundee.

Death of Dr. Blackhall, late of Crimond.

The death took place on June 30th at West Didsbury, Manchester, of Dr. Adam Blackhall, late of Crimond. Dr. Blackhall, who was a native of Fraserburgh, studied at the University of Aberdeen, and graduated M.B., C.M., and later M.D., of that University. For nearly 30 years he practised at Crimond. Seven years ago he retired and went to the south of England for the benefit of his health. A few months ago he underwent a rather serious surgical operation and never completely recovered. The deceased gentleman, who was unmarried, was very well known in Fraserburgh and district, and was a justice of the peace for Aberdeenshire. On leaving Crimond he was presented by his patients and friends with an illuminated address and a silver salver in recognition of the respect and esteem in which he was held in the community

Appointment for a Shetland Medical Man.

Dr. John K. Jamieson of Sandness, Shetland, has been appointed professor of anatomy in the University of Leeds. Dr. Jamieson is a graduate of the University of Edinburgh and has for some years been chief demonstrator of anatomy in the University of Leeds.

July 4th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Compulsory Irish.

THE decision of the Senate of the National University of Ireland that Irish shall be a compulsory subject at matriculation examinations in and after 1913 has raised a storm of protest in many educational quarters. A recommendation in favour of this action was presented to the Chancellor and Senate by a deputation from the General Council of the County Councils, which offered special scholarships should this recommendation be adopted. The movement for the revival of Irish as a spoken tongue has gained in power during the last few years, but it is felt that the educational value of the language is not sufficient to justify its study being made compulsory for professional students. The decision is one highly unfavourable to the advancement of the study of medicine at the National University of Ireland. The medical curriculum is already a very full one, and this addition of an extra subject which has no practical utility will undoubtedly prevent many intending medical students from entering the University.

Libel Action against a Hospital Committee.

On June 23rd the Lord Chief Baron delivered judgment in favour of the Incorporated Dental Hospital of Dublin in an action brought against it for libel by Mr. Keogh. The plaintiff who, although not a qualified dentist, had practised for some years at dentistry work, applied for admission to the Dental Hospital. His application was refused in the following resolution:—

> Resolved, that Mr. Keogh cannot be accepted as a student at this hospital, the committee having the right by their bye-laws to refuse any student without assigning cause.

This resolution contained the alleged libel, and the opening of the letter in which it was sent constituted "publication." The motion was dismissed with costs as groundless.

Dublin Death-rate.

At the last meeting of the public health committee of the Dublin corporation a report was read on the death-rate during the fortnight ended June 25th last. The rate from all causes in the city area was in the ratio of 18·0 per 1000 persons living, as against a mean rate in the corresponding period in the previous ten years of 20·3. In the preceding fortnight the very low rate of 16·3 was recorded, which was 5·2 below the mean rate. During the first half of the current year and the latter part of last year the death-rate had shown a steady decrease as compared with the corresponding period in the previous ten years. The zymotic death-rate had also shown a decided fall. Thi decrease, which showed itself in the latter part of the previous year, has continued up to the present. The committee considered this decrease in the death-rate very satisfactory and an indication of steady progress in the sanitary improvement of the city. The death-rate in Dublin is still, however, very high, as a rule the highest in the kingdom, and among the four or five highest in Europe. The public health department is insufficiently manned, and the city does not possess a whole-time medical officer of health.

Dread of Tuberculosis.

The education of the public concerning the infectivity of tuberculosis has seemingly its bad side in that in some cases an unreasonable fear of the disease is roused. An instance of this has occurred in relation to the Royal Hospital for Incurables, Dublin. This institution, which stands in large private grounds in the suburbs, has for over a hundred years given a refuge to incurable cases of tuberculosis. At present some 39 beds are set apart for such cases. Considering the pressure of candidates for admission to the hospital the governors have decided to increase their accommodation by building a pavilion to contain 100 beds for patients suffering from tuberculosis. To this extension an unreasoning opposition has sprung up among some of

the residents in the neighbourhood. Various misleading rumours as to the intentions of the governors got afloat. The lack of any rational ground of fear was exposed by the President of the Royal College of Surgeons at the annual meeting of the hospital last week, when he assured his hearers that they ran more risk of contracting tuberculosis in any of the streets of Dublin than in the wards of the hospital, much less in its grounds. In the experience of the hospital no evidence could be found of infection spreading from tuberculous patients to other patients or to nurses.

Two Resignations.

Dr. J. M. Finny, who has been King's professor of the practice of medicine in the School of Physics, Trinity College, since 1882, has this week retired from office. The appointment is made for terms of seven years, and on this occasion Dr. Finny declined to permit his name to go forward for re-election. His retirement from the chair of Medicine does not mean that he is withdrawing from active work. This week was announced the retirement of Sir Thornley Stoker from the active staff of the Richmond Hospital, of which, since the death of Sir William Thomson last year, he has been senior surgeon. For some weeks past his health has not been satisfactory, and he has felt it necessary to relieve himself of active work. It is hoped that rest may restore to him a considerable degree of health.

Serious Epidemic of Measles in Belfast.

A serious and widespread epidemic of measles has been, and is still, prevailing in Belfast with an abnormally high mortality. During the eight weeks ending June 25th, between 260 and 270 deaths have occurred, and during the week ending June 25th, as reported in the local press and taken from the weekly return of the Registrar-General, 36 deaths occurred in Belfast, while in the whole of the rest of the urban and rural districts of Ireland there were only 3 deaths from this disease, these occurring in Londonderry. The statistics of previous years, as pointed out in an article in the *Belfast Northern Whig* of July 1st, preclude the idea that the present is an exceptional epidemic, for in 1908 there were 186 deaths from measles in the city; in 1907, 201; and in the years from 1901 to 1908 inclusive, 1553 deaths occurred in Belfast from measles. If we take an ordinary estimate that for every death 10 have been ill, it shows the enormous magnitude of the epidemic, and who can estimate the complications or the sequelæ that have occurred? At the meeting of the city council held on July 1st the medical officer of health reported that during the past five weeks the death-rate from zymotic disease reached in Belfast the truly terrible figures of 6·5, while in Dublin it was only 0·7, in Cork 0·3, and in Londonderry 0·9. This deplorable death-rate is due to the fact that the mortality from measles has actually reached 5·3, or, in other words, nearly 1 in 4 of all the deaths in the city. The total death-rate of the city of Belfast is now 22·6 per 1000. In the same period of last year it was only 17·6, but it is now much higher than in any other city or town in Ireland.

The Treatment of Consumptives.

The town council of Lurgan, on the suggestion of its progressive officer of health, Dr. Samuel Agnew, has decided to arrange for sending patients suffering from consumption to some suitable sanatorium at the public expense, £25 to be the maximum amount spent annually.

The Belfast Coroner.

Dr. James Graham, coroner for the city of Belfast, was on July 4th, at the City Hall, Belfast, presented by his patients with a magnificent motor-car—a Daimler with a limousine body. Interesting speeches were delivered on the occasion, indicating what a strong hold Dr. Graham has on the regard of his numerous friends.

July 4th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Tumours Produced by Surgical Dressings.

M. Paul Reynier is of opinion that certain kinds of dressings applied to wounds may lead to the formation of inflammatory deposits simulating tumours, and at a meeting of the Academy of Medicine, held on June 21st, he gave clinical details of two cases which supported this view. He said that such mishaps were more common than was generally supposed, evidence to this effect being readily obtainable by those who took the trouble to look for it. As the gauze which was supplied to hospital wards sometimes had a fleecy surface and was overheated in sterilising, when compresses made of it were used for absorbing the fluids present in wounds it was very difficult to prevent them from leaving fragments of vegetable fibre in the tissues. It would be desirable to have all these compresses hemmed. The larger sizes of these fibres remained on the surface of the wound and were harmless, but the very small ones might be taken up by the capillary lymphatics and carried along until they were stopped by an abrupt bend, where they gave rise to defensive processes of phagocytosis and sclerosis, which might be mistaken for a relapse or a metastasis. The diagnosis of this condition was particularly difficult, but could be made when there was a very short interval (less than 20 days) between the operation and the pseudo-relapse, and especially when the size of the growth was out of proportion to its duration. It ought to be remarked that in the cases described by M. Reynier the presumed embolism of fibres from the dressings occurred in patients already suffering from tumours, and that the condition of the tissues in which the pseudo-relapses made their appearance might be of importance. This, however, was a hypothesis which would have to be tested by the subsequent course of events.

The Société de Médecine of Paris.

At a meeting of the Société de Médecine held on June 25th M. P. Ménière showed an apparatus with which definite doses of mercury could be administered to syphilitic patients by inhalation of mercurialised air. This apparatus has been in use for the last three months in the wards of M. Queyrat at the Hôpital Ricord and the results obtained have been very encouraging. M. Ménière said that although this method might not be therapeutically more efficacious than other modes of treatment it was at least free from all their inconveniences.—M. de Keating-Hart, discussing the treatment of cancer by fulguration and by electro-coagulation respectively, said that electro-coagulation was a kind of blindfold surgery, which might even produce ill-effects by stimulating the germs in the deeper tissues. Fulguration had a salutary effect on the local trophic processes in consequence of a remote action of the electric spark on the spinal cord.—M. André Lombard in the course of remarks on the treatment of hæmophilia, albuminuria, and glycosuria, said that these three conditions sometimes had an origin in common—namely, an alteration in the plasticity of the blood. It was therefore probable that gelatin given by the mouth might be beneficial in such cases and in his hands this method of treatment seemed to have a beneficial effect.

July 5th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Asiatic Cholera in Berlin.

ON June 23rd the daily newspapers of this city announced that a Russian emigrant on his way to America had shown symptoms of cholera. He died after an illness of only 30 hours' duration, and the bacteriological examination made in the Institution for Infectious Disease proved that the case was really one of Asiatic cholera. The news has up to the present time caused scarcely any alarm. Berlin is traversed by the railway connecting Russia with Hamburg and Bremen, the seaports from which the majority of emigrants depart for America. Owing to the notorious negligence of the Russian officials reliable information as to the existence of epidemics in Russia is difficult to obtain, and is given as a rule only when the epidemic has become rather widely spread. To avoid infectious diseases being imported very strict measures are therefore taken by the German Government with regard to Russian emigrants. Not only have they to undergo a careful medical inspection at the frontier, where every emigrant suspected to be ill is refused entrance, but they are also conveyed by special trains to Berlin, where a special station has been provided for them outside the city at some distance from other dwellings. Here they are once more medically inspected and are not allowed to continue their journey until they have been found healthy. In the present instance the man's appearance attracted the

attention of the inspecting medical officer, and when questioned he admitted that he suffered from diarrhœa. He was at once isolated at a special pavilion existing for such purposes near the above-mentioned station, his family and the persons who had travelled in the same carriage with him being isolated in another pavilion. Both the railway carriage and the luggage and clothes of the isolated persons were disinfected. The other travellers by the emigrants' train were allowed to proceed to Hamburg, where the Russian emigrants are dealt with in a similar way and are as much as possible kept apart from the general population until they are brought on board ship. Harsh as these measures may appear, they are absolutely necessary on account of the immense number of Russian emigrants who pass through Germany, coming partly from localities where infectious diseases exist.

Treatment of Syphilis by a New Arsenical Compound.

At the last meeting of the Berlin Medical Society the new antisyphilitic remedy discovered by Professor Ehrlich of Frankfort was the only subject of discussion. This substance, which was mentioned in THE LANCET of June 18th, p. 1719, in the account of the German Congress of Internal Medicine, recently held in Wiesbaden, has in accordance with its chemical composition received the name of dichlorhydrat-dioxy-diamido-arsenobenzol. At the Congress Professor Ehrlich stated that Professor Iversen of St. Petersburg had found that in relapsing fever an intramuscular or intravenous injection of it completely destroyed the spirilla, and Dr. Schreiber of Magdeburg mentioned that it possessed remarkable antisyphilitic properties. Dr. Wechselmann, the chief physician to the syphilitic department of the Virchow Hospital in Berlin, was the first who had an opportunity of using it on a large scale in the treatment of syphilis, and the results reported by him at the meeting of the Berlin Medical Society were so astonishing that the audience became quite enthusiastic. Dr. Wechselmann said that he had administered it to 90 syphilitic patients in early and also in advanced stages of the disease, and when using a solution of 0·4 per cent. strength he had found that after a single injection the severest symptoms disappeared in a few days. In some cases of tertiary ulceration of the palate and nose, apparently hopeless cases which had not been benefited by treatment with mercury and iodine, an injection of the new remedy was followed by rapid cicatrisation. Among the cases of recent syphilis there were some patients who also suffered from well-marked anæmia, emaciation, and cardiac debility; great caution had to be observed in giving them mercury, but the new arsenical compound agreed with them very well, and after taking it the alarming symptoms disappeared. Dr. Wechselmann showed a series of patients to whom the newly discovered drug had been administered, and for purposes of comparison he also showed models in wax representing the characteristic lesions as they appeared before the treatment. Dr. Schreiber (Magdeburg), who had come to Berlin for the purpose of attending the meeting, confirmed the statements already made by him at the Wiesbaden Congress. Dr. Alt, chief medical officer to the provincial lunatic asylum at Uchtspringe, reported the results of the treatment in cases of general paralysis of the insane, a condition which was now frequently regarded as a late sequel of syphilis. He had observed some remarkable instances of improvement, and even in one case recovery to such an extent that the patient was able to resume his occupation. Further experience will be required before a definite opinion can be pronounced on the merits of the new discovery. Several trustworthy observers, however, agreed that a single injection made the gravest symptoms disappear within a few days, whereas the use of mercury or iodine required a considerable time to produce the same effect and was liable to be attended with toxic symptoms, to which the new compound did not give rise. The opinion was expressed that if the good effects of the new drug were permanent it would revolutionise not only the treatment of syphilis but also various hygienic measures, including the regulation of prostitution. Syphilis would then be a less formidable disease, just as small-pox had lost most of its terrors since Edward Jenner's introduction of vaccination. The meeting was deeply impressed by the evident importance of Professor Ehrlich's discovery, and the welcome which he received was of the most animated description.

June 28th.

ITALY.

(FROM OUR OWN CORRESPONDENT.)

Psychology in Sculpture.

ANOTHER stage in the development, intellectual and moral, of that rather inscrutable personality, the Emperor Augustus, is now in evidence for the student, thanks to Rome's latest addition to her treasure trove. This is a statue of the

"tutela præsens
Italiæ domineque Romæ,"

exhumed on the 3rd inst. 20 feet below the Via Labicana where it crosses the Via Mecenate. Covered with the soil in which it had lain for a millennium it was found to be of special interest, and was accordingly claimed as State property to be exhibited *pro bono publico* in the Museo Nazionale Romano. It measures over 6 feet and represents Augustus as sacrificing, with toga drawn over his head. The attitude is not dissimilar to that of the Emperor in the Vatican Museum, unearthed 67 years ago in the Villa of Livia on the Flaminian Way; but the expression is that of an older man, the features worn, not to say wasted, marked with lines of care. The figure is somewhat flat and the toga in which it is draped falls in many folds. Inferior, perhaps, to that in the Vatican, it has an interest of its own, telling of years of strenuous work, of anxious thought, and of the end of all things in the near future. There is a pathos in the expression akin to that which saddens us in the bust of Marcus Aurelius, whence the good Emperor looks out wistfully and hopelessly on Rome's inevitable decline and fall. Augustus may now in statuary be studied in his boyhood, his prime, and his later years—the first stage represented in the bust found in 1805 by Consul Fagan, in which he figures as a thoughtful youth, with infinite capacities in statecraft; the second in the imperial pose of the triumphant Emperor, wielding the world's destinies; the third in the pathetic guise of the hierophant, head of a cult in which he did not believe, and all too prescient of the empire's fate in other and less competent hands. The illness, moreover, of which the physician Antonius Musa cured him by the cold water treatment seems to have returned, the facial lines indicating the dyscrasia of the circulatory system associated with the rheumatoid cachexia. The three sculptured presentations, indeed, have been signalised by a distinguished art critic as affording material for an interesting historical study, in which the findings of a Mommsen or a Ferrero may be illustrated or checked by the artist working in Pentelic and Parian marble.

The Senator Schiaparelli.

All Italy, and indeed the scientific world in general, anxiously awaited the medical bulletins last week announcing the stages in the illness of the illustrious astronomer, who, as Director of the Milanese Observatory, held in his special *métier* a position not inferior to that of his lately deceased compatriot in chemistry, the Senator Cannizaro. Aged 75 years, Schiaparelli had been betraying symptoms of arterio-sclerosis, culminating in a cerebral thrombosis which had impaired the centre of articulate speech. While unable to express himself in words, he had full command of his faculties and maintained serenity until the end yesterday. Some ten years ago he had a seizure premonitory of the affection from which he died, associated, moreover, with "disturbi viscerali" (intestinal disorders). His well-known reluctance to spare himself in the duties of his post counted for something in the sad issue of his illness, exceptionally exacting as these duties had been these many months past, during which he had been employed, in coöperation with brother astronomers in Germany, on what his medical advisers refer to as "un lavoro ponderoso."

July 5th.

CONSTANTINOPLE.

(FROM OUR OWN CORRESPONDENT.)

Inadequacy of the Mussulman Hospitals.

THE Mussulman hospitals of Constantinople treat unusually large numbers of patients, and it has been found that the medical and administrative staffs of these charitable institutions are wholly inadequate to meet, in a satisfactory manner, the present-day needs of the city. The authorities have therefore decided to send some of the patients to the Greek and Armenian hospitals. The Armenian Patriarch, however,

who has been advised of this decision, protests against it. He states that during the former absolutistic *régime* the Armenian hospital used to receive from the Ottoman Government considerable quantities of meat and bread, but for the sake of economy these allowances were withdrawn soon after the establishment of the Liberal Government. The Armenian hospital has sufficient work to do without taking in additional patients from the Mussulman hospitals, receiving, as it does, from 800 to 1000 patients per month. The Patriarch concludes his protest by stating that if the former allowances are continued he will favourably consider the reception of patients from the Mussulman hospitals.

A Hospital at Mush.

The Armenians of the Caucasus, Russia, have subscribed 150,000 francs for the erection of a hospital at Mush. A medical man, a graduate of a Russian University, who is to be the chief of this hospital, has arrived at Constantinople for the purpose of obtaining a permit to practise medicine in Turkey. The hospital will receive Moslem as well as Kurd patients.

A Wise Hygienic Measure.

It has been found that a number of the Constantinople police are suffering from venereal and syphilitic diseases. The medical authorities have therefore decided to submit all policemen to a thorough physical examination and to dismiss from the service those who are found to be suffering from any infectious disease.

A Medical Congress at Sofia.

A congress of medical men of the Slav countries will be held next month at Sofia. I understand that King Ferdinand of Bulgaria takes a vivid interest in this congress and will give it his support. Dr. Béron, the President of the Bulgarian Medical Association, has left for Prague in order to prepare the programme of the congress in concert with the central committee of the Slavic General Medical Federation.

A Strange Measure.

There are a number of medical men in the municipal service of Constantinople and the provinces who have studied abroad and who have only diplomas of foreign universities. The Ottoman Government has now decided that for the future all the municipal medical men will be chosen only from among the graduates of the Imperial Medical Faculty of Constantinople. This boycott will certainly not prove to be of benefit to the country.

Great Disasters in the Provinces.

Grave news of disaste. come from several villages where the hail-storms and inundations have been severe. Especially sad is the following telegram received from Erzerum: "To-day 65 dead bodies have been discovered in the rising waters. It is believed that the number of deaths exceeds a hundred. 300 animals have perished. 121 houses, including two theological seminaries and the mosque of Kassim Pasha, the greatest in the whole of the Ottoman Empire, are completely destroyed. 35 other houses are in danger of tumbling down and 140 buildings are very badly damaged. Most of the bakers' shops are destroyed, and there is great want of bread." Terrible inundations are reported also from Adrianople. The train communication with Western Europe has been interrupted.

June 18th.

UNITED STATES OF AMERICA.

(FROM OUR OWN CORRESPONDENTS.)

Medical Education in the United States.

THE subject of medical education in the United States occupies considerable attention. For years a strenuous effort has been made to raise the average standard by elevating or suppressing a large number of chartered proprietary medical schools which continue to grind out yearly a considerable number of insufficiently educated physicians. At the meeting of the National Confederation of State Examining Boards a very severely critical report on the educational facilities of many of these schools was issued by the president of the Carnegie Foundation, Dr. H. S. Pritchett, and Mr. Abraham Flexner (a brother of Dr. Simon Flexner), also of the Carnegie Foundation. This report condemned in unsparing terms many of these commercial medical schools, and in the State of Missouri mentioned only three—the St. Louis University, Washington University, and the State University—as being up to the standard (during 1909 St. Louis University had the lowest percentage of failures at the different State licensing boards of any medical school in the entire country). This report roused a great deal of bitter comment on the part of those connected with schools condemned, which was not lessened by the report of the Council on Medical Education of the American Medical Association, which, in an independent investigation, had arrived at practically the same conclusions. For the improvement of educational conditions the Council recommends the following requirements as the "American standard": a four years' high school education; a year or two in the university laboratories of chemistry, physics, and biology; four years in a medical school, and a clinical year as an interne in a hospital. The report states that about two-thirds of those schools in the country which deserve recognition have either already put into force the requirement of college physics, chemistry, and biology, or will put this requirement into force this fall. Sixteen schools are now requiring, and ten more will require from the coming school year on, two or more years of work in a college of liberal arts in addition to the four years' high school education, while 21 schools either require now, or have announced that they will require, one year of college work in addition to the four years' high school education. The College of Physicians and Surgeons of St. Louis, which is one of those schools assailed in the report of the Carnegie Foundation, has brought an action for $100,000 damages for defamation against Dr. Pritchett, Mr. Flexner, and Dr. Simmons, the secretary of the American Medical Association.

Number of Physicians in the United States.

It may be of interest to British medical men to report the condition in each State, as determined by the Council of the American Medical Association, in regard to the number of practising physicians: Alabama has 1 physician to every 924 people; Arizona, 1 to 626; Arkansas, 1 to 583; California, 1 to 401; Colorado, 1 to 386; Connecticut, 1 to 740; Delaware, 1 to 900; District of Columbia, 1 to 262; Florida, 1 to 865; Georgia, 1 to 886; Idaho, 1 to 664; Illinois, 1 to 587; Indiana, 1 to 557; Iowa, 1 to 605; Kansas, 1 to 642; Kentucky, 1 to 649; Louisiana, 1 to 900; Maine, 1 to 605; Maryland, 1 to 655; Massachusetts, 1 to 567; Michigan, 1 to 649; Minnesota, 1 to 981; Mississippi, 1 to 870; Missouri, 1 to 552; Montana, 1 to 800; Nebraska, 1 to 602; Nevada, 1 to 239; New Hampshire, 1 to 652; New Jersey, 1 to 925; New Mexico, 1 to 626; New York, 1 to 617; North Carolina, 1 to 1216; North Dakota, 1 to 971; Ohio, 1 to 585; Oklahoma, 1 to 581; Oregon, 1 to 646; Pennsylvania, 1 to 655; Rhode Island, 1 to 724; South Carolina, 1 to 1324; South Dakota, 1 to 820; Tennessee, 1 to 681; Texas, 1 to 653; Utah, 1 to 908; Vermont, 1 to 533; Virginia, 1 to 917; Washington, 1 to 616; West Virginia, 1 to 706; Wisconsin, 1 to 930; and Wyoming, 1 to 541. From these figures it will be seen that everywhere, except in the two Carolinas, the competition is much keener than is allowed by the ordinary British estimate of 1 to 1000 as a minimum.

The American Federation of Sex Hygiene.

This new association was founded during the meeting of the American Medical Association, with a view to educating the public in sexual physiology and hygiene, and combating the spread of venereal diseases by every method, educational, sanitary, moral, and legislative. Among the officers are: Honorary President, Dr. Charles W. Eliot, professor emeritus and former president of Harvard University; President, Dr. Prince A. Morrow of New York. Every State and local organisation in the United States dealing with the sociological aspects of sex problems is eligible for membership.

Women's Medical College of Pennsylvania.

The sixty-first annual report of this College, which is situated at Philadelphia, has just been issued, and will be pleasant reading to those specially interested in the advancement of women and in the organisation on practical lines of women's work. Medical women attending this College must be of good moral character, of which they must present a certificate signed by two reputable citizens, preferably physicians, and they must possess a Bachelor's degree from an approved college or university, and a diploma from an accredited high school, normal school, or academy, or pass a special examination. Every candidate for the degree of

Doctor of Medicine must attend four full courses of instruction in four separate years.

The Rôle of the Pharmacist.

The address of the chairman of the Section on Scientific Papers at the recent annual meeting of the American Pharmaceutical Association was noteworthy from the fact that it dealt with the failure of pharmacists as a body to do their part in the development of the science of medicine. He gave it as his opinion that pharmacists as a class have done little more in this direction than occasionally endeavour to utilise the results of other workers in the exploitation of proprietary medicines of questionable value. Pharmacists, he thought, have been particularly backward in recognising the limitations of medicines and the possible harm that may result from their abuse. While it is true that the art of synthesis may have added valuable substances to our store of remedial agents, it is a grave question whether the results so far achieved are not to be deplored rather than lauded, whether the lives unduly shortened do not actually outnumber the lives that have been prolonged by the all too liberal use of the products of the tar barrel. While the extent of the responsibility of the pharmacists for this state of things cannot be precisely determined, he thought it certain that their indifference to ultimate results was responsible for many of the abuses in connexion with so-called synthetic remedies. As a class pharmacists have become so indifferent to the use of drugs that they do not always fully appreciate the possibility that even the continued use of saline cathartics, or of the widely advertised purgative mineral waters, may do harm directly by developing a tendency to spastic constipation, and indirectly by masking for a time symptoms that may prove to be the early indications of a serious disorder. Apart from physicians in active practice, no class of men can exert a more beneficent influence in safeguarding the abuse of drugs than the pharmacists who supply them to the community. The true vocation of the pharmacist is to develop our knowledge of drugs and the best methods of presenting them to the patient. It should be his province to apply the results of scientific research, to aid in replacing crude drugs by definite principles, and to urge the abandonment of unscientific and inert products. These observations, though made to an American audience, serve to show that the pharmacist, wherever he may ply his art, serves his day and generation best when he recognises the possibilities of doing useful work that are daily presented to him in safeguarding the health of the public and in doing his part in the investigation of those drugs which he knows are unsatisfactory and capable of being improved.

June 28th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The National Medical College of India.

THE prospectus has been issued of an institution calling itself "The National Medical College of India." This "College" is located at Calcutta and has been incorporated under Act XXI. of 1860, promulgated by H.E. the Viceroy of India and Governor-General in Council. It has as its objects the provision of medical instruction to native students who cannot afford what is termed the heavy fees of the recognised colleges which are State-aided by the Government of India. The prospectus sets forth a list of examiners for 1910–11, but the subjects which they are appointed to examine in are not stated. This list contains the following names:—

External examiners.—His Highness the Maharaja Bahadur Gondal, M.D., F.R.C.P. Edin.; Sir Bhal Chandra Krishna, L.M.K.T.; Lieutenant-Colonel R. L. Dutt, M.D., I.M.S. (retired); Lieutenant-Colonel U. N. Mukerjee, M.D., I.M.S. (retired); Lieutenant-Colonel D. D. Basu, M.D., I.M.S. (retired); Major B. D. Basu, M.D., I.M.S. (retired); Dr. R. Rao, M.D. Lond., D.Sc. Lond.; Dr. M. Sreenevasa Rao, M.D., D.Sc., F.R.C.S. Edin.; Dr. M. Bhajekar, M.D., F.R.C.S.

Internal examiners.—Professors: S. K. Mullick, M.D., M.S. Edin. (diseases of chest and clinical medicine); B. K. Chatterjee, D.P.H. Cantab., L.R.C.S., L.R.C.P. Edin. (sanitation); A. Roy, L.M.S. (surgery); B. C. Ghose, M.A., M.B., C.M. Cantab. (medicine); D. R. Dass, L.R.C.P., L.R.C.S. Edin., L.M. Rotunda, &c. (midwifery and gynæcology); A. K. Mukerjee, L.M.S.; S. B. Mittra, L.M.S.; Jitindra Nath Sen, M.A. (Hon.); A. Niyogi, L.M.S. (superintendent); K. C. Dutt, L.M.S.; S. Sanyal, L.M.S., B.Sc.; N. N. Chuckerbutty, L.M.S.; Kaviraj Ganendra Nath Sen Kaviratna; and Kaviraj Jatindro Nath Sen Kaviranjan.

The period of study required to complete the course is laid down at five years. The following diplomas are awarded: 1. The F.C.P.S (Fellow of the National College of Physicians and Surgeons). The diploma will be conferred by ballot and is apparently to be limited as an honorary distinction to be conferred on scientists of distinction who have enriched some branch of science by original research. 2. The M.C.P.S. (Member of the National College of Physicians and Surgeons). 3. The L.M.S. (Natl.) (Licentiate in Medicine and Surgery of the National Medical College of India). The last two diplomas are to be conferred by examination. 4. The D.P.H. To meet the demand for sanitary officers it has been decided to train qualified scholars for proficiency in public health.

The most remarkable feature about this college appears to be its financial status. We are informed in the prospectus that "we train our boys under the best masters, with European and local qualifications, who labour for the college at a great sacrifice, *the welfare of the scholars being their only reward*" (the italics are mine). The fees to be paid by the students taking out classes are as follows:—Admission fee Rs. 3 (4*s.*); fee for the M.C.P.S. class, Rs. 4 (5*s.* 4*d.*); and for the L.M.S., Rs. 3 (4*s.* 0*d.*) per month; for practical classes and dissections the fee is Rs. 5 (6*s.* 8*d.*) for the session. The prospects of students passing out of the College are set forth as follows: "Students passing from this College can enter to the medical department of railways, steamer services, district boards, municipalities, tea estates, collieries, private charitable dispensaries, special segregation camps, family physicians to zemindars, feudatory states, and the rise of the national spirit makes them doubly welcome as private practitioners."

Medical News.

UNIVERSITY OF LONDON.—At examinations held recently the following candidates were successful:—

M.B., B.S. EXAMINATION.

Honours.—*Joseph Dudley Benjafield, University College Hospital *† Eric Gerald Gauntlett (University medal), King's College Hospital; *Thomas Duncan Macgregor Stout, Guy's Hospital; and ‡Francis Martin Rouse Walshe, University College Hospital.

* Distinguished in Medicine. † Distinguished in Forensic Medicine. ‡ Distinguished in Surgery.

Pass.—William Reginald Ward Asplen, Westminster Hospital; Cyril Banks, University of Sheffield; Henry Lewis Barker, St. Mary's Hospital; John Nathaniel Beadles, Westminster Hospital; Leonard Christopher Blackstone, University College Hospital; Edward Spencer Calthrop and Angel Camacho, Charing Cross Hospital; Bernard Arthur Cheadle, St. Thomas's Hospital; George Henry Chisnall, London Hospital; Ethel Mary Connan, London (Royal Free Hospital) School of Medicine for Women; Ardeshir Koyajt Contractor, University College Hospital; Emily Susan Cooke and Nina Gertrude Cotton, London (Royal Free Hospital) School of Medicine for Women; Goronwy Meredith Davies, St. Thomas's Hospital; Donald Frederick Dobson, University of Leeds; James Philip Elias, Victoria University of Manchester; Edgar Lionel Elliott, Guy's Hospital; Sidney Frank Fouracre, Charing Cross Hospital; Harold Gardiner, Guy's Hospital; Douglas Green, University of Sheffield and University College Hospital; Henry Hingston, Westminster Hospital; Edward Leslie Horsburgh, Victoria University of Manchester; Stanley Hoyte, Westminster Hospital; Arthur Ernest Iles, University of Bristol; Anne Louise Jane Kann, London (Royal Free Hospital) School of Medicine for Women; David Kennedy, University College Hospital; Norman Claudius Lake, B.Sc., Charing Cross Hospital; Theodore Stewart Lukis, St. Bartholomew's Hospital; George Maxted, Guy's Hospital; Marjorie Eva Middleton and Ethel Mary Morgan, London (Royal Free Hospital) School of Medicine for Women; Hubert O'Meara, University College Hospital; Dosabal Rustomji C. Patell, London (Royal Free Hospital) School of Medicine for Women; William Norman Pickles, University of Leeds; Wilfrid Langrish Pink, St. Thomas's Hospital; Arthur Borland Porteous, St. Mary's Hospital; Simon Isaac Rabbinowitz, London Hospital; Norbert Leo Maxwell Reader, Guy's Hospital; Ernest Edward Andrew T. Rigg, University College Hospital; Mary Cowper Scott, London (Royal Free Hospital) School of Medicine for Women; Ernest Gerald Stanley, St. Bartholomew's Hospital; Tom Stansfield, Guy's Hospital; Harold Herbert Tanner, St. Mary's Hospital; Harold Lindley Tasker, University College Hospital; Norman Tattersall, Victoria University of Manchester; Cecil Carrington Tudge, Guy's Hospital; William Reginald Margetts Turtle, London Hospital; Robert William Walker Vaughan, University College Hospital; Philip John Veale, University of Bristol; Arthur Leonard Weakley, St. Bartholomew's Hospital; Walter Weir, St. Thomas's Hospital; Robert Heywood Wilshaw, Victoria University of Manchester; and Robert Noel Woodsend, University College Hospital.

The following candidates have passed in one of the two groups of subjects:—

Group I.—Kathleen Baylis, London (Royal Free Hospital) School of Medicine for Women; Frederick Leslie Brewer, University College Hospital; Hugh Arrowsmith Grierson, University of Liverpool; Walter Shirley Kidd, Guy's Hospital; Mark Alleyne Nicholson, London Hospital; John Valentine Rees, London Hospital and University College, Cardiff; and Charles Witts, Guy's Hospital.

Group II.—Thomas Knowles Boney, St. Bartholomew's Hospital; Edward George Huxley Cowen, Charing Cross Hospital; Arthur Neville Cox, Guy's Hospital; Roger Bellis Edwards, University of Liverpool; Thomas Charles Cann Evans, St. Mary's Hospital; Thomas Woodcock George, London Hospital; Katherine Anne Gill, London (Royal Free Hospital) School of Medicine for Women; Evan Hugh Jones, St. Thomas's Hospital; Evan Rhys Jones, St. Bartholomew's Hospital; Alfred Rverard Lees, Guy's Hospital; Kenneth Dalrymple Marriner, St. Thomas's Hospital; Raymond Montgomery, Guy's Hospital; Arnold Renshaw, Victoria University of Manchester; Arthur Leyland Robinson, University College Hospital; Henry Gordon Smith, St. Bartholomew's Hospital; Harold Thwaite, University of Birmingham; Stanley van Someren Boyd, London Hospital; and Elsie Warren, London (Royal Free Hospital) School of Medicine for Women.

B.S. EXAMINATION (*for Students who Graduated in Medicine in or before May, 1904*).

Harold Hartley, M.D., Victoria University of Manchester; and Olive McDougall, M.D., London (Royal Free Hospital) School of Medicine for Women and Victoria University of Manchester.

COUNTY OF DURHAM SOCIETY FOR THE PREVENTION AND CURE OF CONSUMPTION.—The eleventh annual meeting of this society was held on June 25th in the Sanatorium for Men at Stanhope, Mr. J. A. Hyldyard presiding, in the absence of the President, Lord Barnard. After the reading of the various reports the chairman of the committee, Dr. W. Robinson of Sunderland, moved their adoption. He briefly referred to the death of the late King Edward and then alluded to the late Professor Koch, whose work had placed the crusade against consumption on a scientific basis. He stated with pleasure that the death-rate from tuberculosis in the county had fallen from 2·13 in 1897 to 1·7 in 1908, and said that this was due in the main to improvement in general sanitation, and to the disease being arrested in many cases by modern rational treatment in sanatoriums and elsewhere; in spite of this, the toll of lives from the disease was still enormous and its cost to the country (England and Wales) was not less than £7,000,000 a year. Now that the bulk of the scientific work necessary to eradicate the disease was accomplished, he urged that the time had come for statesmen and local authorities to put in force those special preventive measures which would eliminate this greatest cause of death from amongst them in a generation. He invited the friendly societies to send their cases of consumption early so as to prevent the depletion of their funds, as they could do by giving a subscription of 1*s.* a year per man, as did so many thousand men in various works and yards in the county. 298 patients had applied for admission during the year and 225 were admitted. Of these, local authorities had sent 101 and paid £1407, and subscribing workmen had sent 71 patients and paid £1068. The ordinary subscriptions were only £200. He regretted that only one-fourth of the cases admitted were in an early and curable stage in spite of the most careful selection. In the Stanhope Sanatorium for Men the average daily number of patients was 42·4, the cost of each patient per week was 19*s.* 10½*d.*, and the average stay in the sanatorium was 15·4 weeks. The total cost of stimulants was £1 0*s.* 6*d.* 75 per cent. of the men in an early stage of the disease had been apparently cured. The new diet, which had been adopted a year ago and which was such that working people could also obtain it at home, had resulted in an increased gain of 3 pounds per week over that of last year on an average in early cases. At the Wolsingham Sanatorium for Women and Children the average daily number of patients was 18·6, the weekly cost of each patient was £1 1*s.* 3*d.*, and the average stay was 16·4 weeks. The total cost of stimulants was £1 1*s.* Exercise and graduated work had been more systematised at both places during the year. The ordinary income of the society for the year had been £3877, and the ordinary expenditure £3339. He regretted that their appeal against the income tax authorities had been unsuccessful. He concluded by praising the paid staff. The motion was seconded by Mr. C. E. Thompson and supported by the Bishop of Richmond, who emphasised the successful work accomplished by the sanatoriums, the need for cases to be sent in in an earlier stage by medical men and others owing to the depressing effect of the admission of hopeless cases, and the great value of the regulated work which was carried on by the patients. Councillor Elliott of Gateshead said that the local authorities generally were doing a great deal of work in the improvement of sanitation, and were only held back from doing more by the outcry of the ratepayer against higher rates; he praised the work of the sanatoriums and said that every patient who left became a missionary in the cause of good food and the open window. Votes of thanks terminated the proceedings.

THE SOUTH DEVON AND EAST CORNWALL HOSPITAL, PLYMOUTH: THE WHIPPLE MEMORIAL.—Nearly £250 have been received towards the proposed operating theatre, which is to be erected at the South Devon and East Cornwall Hospital as a memorial to the late Mr. Connell Whipple, who was for so many years on the honorary staff. It is hoped that about £700 will be raised, and subscriptions may be sent to Mr. Hawker, Beaconville, Ivybridge, Devon.

DIET REFORM ON THE CONTINENT.—A correspondent writes: "The outstanding features of the International Vegetarian Congress, held under the patronage of the Belgian Government, which has recently concluded its sittings at Brussels, were the number of foreign medical men attending it or sending contributions, the scientific character of the papers and much of the discussion, and the large membership amounting to 460. As one of the handful of English people present, it occurs to me that a brief account of the proceedings may be of interest to your readers. The Congress, which was organised by the Société Végétarienne de Belgique, met in the Exhibition Buildings in rooms set apart by the Government, which likewise presented official programmes to the delegates and free passes to the exhibition, and was conducted on the lines of a similar official congress held at Paris during the exhibition of 1900. It was preceded by a reception at the Maison des Médecins, one of the famous guild houses in the Grand Place. The delegates were welcomed by Dr. Ernest Nyssens of Brussels, chairman of the executive committee of the Congress and editor of *La Réforme Alimentaire* which, by its scientific methods, has done much to win consideration, alike in France and Belgium, for the subjects dealt with in its pages. The Congress was opened by its honorary president, Professor Huchard of Paris, member of the French Academy of Medicine. Brief speeches followed from the representatives of the various countries. The work of the Congress was divided into four sections, each with its own president. The first section (President: M. Lefèvre, Professor of Biology at Havre) dealt with vegetarianism and hygiene, and was presided over, in M. Lefèvre's absence, by M. Roux, Leader of the Bar at Amiens. The second section (President: Dr. Pascault of Cannes, known for his writings on arthritis) considered the vegetarian system from a therapeutic point of view. The third section (President: Dr. Danjou of Nice) concerned itself with the social and economic aspect. The fourth section (presided over by Mlle. le Docteur Ioteyko, head of the Brussels University Laboratory and editor of *La Revue Psychologique*) considered the moral aspect. Among medical men who contributed papers to the Congress, or took part in the discussions, were Dr. Victor Pauchet, Amiens ('The Vegetarian Régime before and after Surgical Operations'); Dr. Fernand de Grandmaison de Bruno, Paris ('The Vegetarian Régime in Gout'); Dr. Jules Labouré, Amiens ('Education in Breathing for Sufferers from Adenoids'); Dr. A. Haig, London ('Diet as a Factor in the Higher Evolution of Man'); Dr. Pascault, Cannes ('The Physiological Synthesis of a Vegetarian Régime'); Dr. George Petit, General Secretary of the League Against Tuberculosis ('A Vegetarian Régime for Tuberculosis' and 'Sobriety in Diet'); Mme. le Docteur Sosnowska, Paris ('Diet, Air, and Exercise'); Dr. Guelpa, Paris ('Auto-Intoxication'); Dr. Michaelsson, Copenhagen; Dr. Knauf, Lake of Constance ('Diet Reform in Children's Homes'), Dr. Sels, Baden Baden; Dr. Ley, Brussels ('The Organisation of Inebriate Homes'); and Dr. Falp y Plana, Barcelona. In connexion with the Congress three lectures were also delivered to audiences varying from 300 to 600. Professor Huchard spoke on 'The Diet Factor in Mineral-water Cures'; Dr. Marcel Labbé (Professor of Physiology in the Paris University), on 'The Results of Recent Studies in Nutrition'; and Mlle. le Docteur Ioteyko, on 'Vegetarian Diet for Children,' this last being a preliminary study based on the replies to a series of questions propounded by her,

and illustrated by photographs of children, several of whom were on the platform. The lectures and papers are to be published in volume form, while single articles will also appear in *La Reforme Alimentaire* and *La Hygie*. In view of the foregoing," our correspondent adds, "the claim made by M. Roux at a banquet with which the Congress concluded, that 'on peut disputer notre propagande, mais on ne peut plus l'ignorer,' seems not unwarranted."

HER Majesty the Queen has been graciously pleased to become patron of the Invalid Children's Aid Association (London) Incorporated. Her Majesty has long been interested in this association and gave her patronage as Princess of Wales.

THE second annual meeting of the National Food Reform Association will be held at Caxton Hall, Westminster, on Wednesday next, July 13th, at 4.30 P.M. Cards of admission may be obtained from the Secretary, 178, St. Stephen's House, Westminster.

THE annual meeting of the Children's Country Holidays Fund will be held at the Whitehall Rooms, Hotel Metropole (entrance in Whitehall-place), on Tuesday next, July 12th, at 4.30. Lord Brassey will preside, and the speakers will include the Earl of Arran, Mr. C. F. G. Masterman, M.P., Mrs. Barnett, and Miss Violet Markham.

HOSPITAL SATURDAY AT ILFRACOMBE.—At the annual meeting of the committee of the Ilfracombe Hospital Saturday Fund, held on July 2nd, it was reported that as the result of the collections in 1909 the sum of £215 was raised for the local hospital. This amount is exclusive of £33 collected by the local steamboats.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Henry G. Piffard, formerly professor of dermatology in the University and Bellevue Hospital Medical College, New York. Dr. S. S. Zayaïtski, *privat-docent* of gynæcology in the University of Moscow.

ROYAL INSTITUTION.—A general monthly meeting of the members of the Royal Institution was held on July 4th, Sir James Crichton-Browne, treasurer and vice-president, being in the chair, when it was announced that His Majesty the King had graciously consented to become Patron of the Royal Institution.

LITERARY INTELLIGENCE.—Messrs. Kegan Paul, Trench, Trubner, and Co., Limited, will publish shortly a work entitled "Medicine and the Church," being a series of studies on the relationship between the practice of medicine and the Church's ministry to the sick. Among the contributors are Sir Clifford Allbutt, Dr. Charles Buttar, Mr. Stephen Paget, the Bishop of Bloemfontein, Hon. Sydney Holland, Prebendary Fausset, Dr. Jane Walker, Dr. T. Hyslop, Mr. Ellis Roberts, and Dr. H. G. Mackenzie. The work is edited by Mr. Geoffrey Rhodes and contains a foreword by the Bishop of Winchester.

INTERNATIONAL CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.—The Fifth International Congress of Obstetrics and Gynæcology will be held at St. Petersburg from Sept. 22nd to 28th next, under the presidency of Professor Dmitri de Ott. The secretary-general is Professor de Sadovsky. Notices of several important reports and communications have already been sent in. The principal questions set down for discussion are: Cæsarean Section; the Comparative Value of Different Operative Procedures in the Treatment of Displacements and Deviations of the Uterus; the Vaginal Route in Accouchement and Gynæcology; and the Influence of the Nervous System on the Control of Uterine Hæmorrhages. Great Britain is represented by Dr. H. Macnaughton-Jones, as honorary president; Dr. Amand Routh (who is one of the reporters on Cæsarean section), as delegate for the Royal College of Physicians, London, and the Royal Society of Medicine; Dr. E. Malins, Dr. J. B. Hellier, and Mr. E. Tenison Collins, delegates respectively for the Universities of Birmingham, Leeds, and Wales. Dr. T. Wilson of Birmingham and Dr. S. Jervois Aarons of London are also delegated by the Royal Society of Medicine. The secretaries for Great Britain are Dr. W. J. Gow (27, Weymouth-street, London, W.) and Dr. G. F. Blacker (45, Wimpole-street, London, W.), who will be happy to afford any information with regard to the Congress to anyone who proposes to attend it.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Parliamentary Session.

PARLIAMENT will adjourn in the last week of July or the first week of August and will re-assemble in November to complete the work of the session. Apart from the political considerations involved in the arrangement, Members are glad at the prospect of being relieved from attendance at Westminster during August, which is often one of the most trying months for the discharge of Parliamentary duties.

The Budget.

The Budget, which the CHANCELLOR OF THE EXCHEQUER presented on Thursday, June 30th, continues the financial arrangements of the recently passed Finance Act. One of the most notable passages in Mr. LLOYD GEORGE'S statement concerned the social results of the increased taxation of spirits. Comparing 1908-09 with this year, the right honourable gentleman said that there would be a drop of 10,000,000 gallons in the consumption of spirits.

Education (Physical Training) Bill.

Viscount HILL has introduced in the House of Lords a Bill to provide for physical training in elementary, secondary, and continuation schools.

Visit of American Surgeons.

The American surgeons who are now in this country visited the House of Commons on Tuesday, July 5th. They were received by Sir WILLIAM COLLINS and several medical men who have seats in the House, and were entertained to tea on the terrace.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 29TH.

Vaccination in Prussia.

Mr. BLACK asked the President of the Local Government Board, with reference to the report on the preparation and storage of glycerinated calf lymph in Berlin and other places abroad, contained in the supplement to the twenty-sixth annual report of his department, presented to Parliament in 1897, whether in the three years 1906-07-08 there had been in England, with a great decrease in vaccination, 43 deaths from small-pox, while in Prussia, with approximately the same population, there had been 134 deaths from that disease in the same period; and whether there was any reason to suppose that the rigorous enforcement of compulsory vaccination had been at all relaxed in Prussia in the three years referred to.—Mr. BURNS answered: During the three years 1906-07-08 there were 107 deaths from small-pox in Prussia according to the official reports of the Imperial German Central Health Department, and not 134, as stated in the question. On the information before me, I have no reason to believe that any relaxation in the enforcement of vaccination has taken place in Prussia. I may add that the 107 deaths from small-pox were derived from 690 notified cases, and that of this number 219, or nearly one-third, were foreigners, chiefly from Russia, where there is no compulsory vaccination, and where during the period in question small-pox has been widely epidemic.

The Medical Inspection of School Children.

Mr. RAMSAY MACDONALD asked the President of the Board of Education why the Board was not putting into operation that part of Circular 576 which provided that children attending school should be medically examined when they had reached the age of seven, and which was to come into effect in 1909; how far the statement in Circular 576, that the efficiency of the medical inspection of schools should be one of the grounds upon which grants were to be given in future, had been carried into effect; whether in consequence of medical inspection education authorities were complaining that children were being kept away from school, with the result that grants were diminishing rather than increasing; and whether this aspect of the case had been considered by the Board of Education, and how it proposed to meet it.—Mr. RUNCIMAN replied: With regard to the first part of the question, the Board decided to postpone the operation of this requirement in order to enable the local education authorities to perfect their organisation and to systematise the work they are at present doing. The Board found, moreover, that a number of authorities were undertaking, or proposed to undertake, the medical inspection of children of all ages suffering from particular ailments, and the Board was unwilling to interrupt this work, which it hoped would be attended with fruitful results. With regard to the second part of the question, the Board had not in any respect departed from the position taken up in the circular, but I am happy to say that it has not been necessary, up to the present, to withhold grants on account of inefficient medical inspection. With regard to the third and fourth parts of the question, the Board has received complaints from some local education authorities, and it is giving careful consideration to the representations made to it, but I am not yet prepared to make any announcement on the subject.

Mr. RAMSAY MACDONALD: Am I to understand in respect of the first part of the question that the Board of Education has departed from the conditions laid down in Circular 576 requiring the special inspection of school children at the age of seven?—Mr. RUNCIMAN: No. I would not put it in that definite form. We are in many cases accepting the arrangements which have been made by the educational authorities for dealing with the problem in rather a different way, and in many cases, I think, a better way.

Tropical Diseases.

Speaking on the Colonial Office vote,

Colonel SEELY (Under Secretary of State for the Colonies) said: I will not pass from the question of the Crown colonies without making a short reference to the work of the different Schools of Tropical Medicine. I have said that we can develop part of our territories in the tropics. I have told the House a little of what we are doing. But

after all our only justification in all these countries is that we are doing good to the natives who were there before us. Whether as a consequence of the coming of the white man or not, but certainly coincident with it, there has been a spread of various diseases of an extraordinary and fatal character. The spread of sleeping sickness alone has been one of the most remarkable and one of the most disastrous events in the history of Africa. How many thousands have died from it we do not know. Tremendous efforts are being made by many countries—and I think we may claim especially this country—to combat this great scourge. Sir David Bruce and his wife went into the very heart of the district and spent many months investigating this great scourge, sleeping sickness. Almost everyone in the place where they lived was suffering in some degree from sleeping sickness. When I tell the House that out of hundreds of thousands of cases we do not know for certain of one single case where the man has recovered, I think honourable Members will realise to a much greater extent than ever before that those who are trying to combat tropical diseases take their lives in their hands when they go out to work in this great cause. Many have worked in it. Some have already died in it, and their names are, alas, already forgotten. However, this I will say, that when the history of brave deeds comes to be written, the brave deeds that these workers are doing in the heart of Africa to combat these insidious and most fatal diseases will not be forgotten, and will, perhaps, be considered as being a more striking proof of the ability of men to overcome natural fear than almost any other in the annals of mankind. From what we know now these diseases, or at any rate the bulk of them, are caused by different kinds of flies. It is probable that others will also be found to be caused by flies. It was thought that removing the natives from the fly-infected area would completely safeguard them. Sleeping sickness, for instance, is transmitted by the tsetse fly known by the name of glossina palpalis, and it was thought that if the population could be removed from the shore of the lakes where the tsetse fly lives they would escape infection. Unfortunately, this has not proved to be entirely the case. Still, we do know a great deal more than we did about the origin and the cause of sleeping-sickness. We have checked the mortality to a most remarkable degree.

The Medical Department of the Navy.

Lord CHARLES BERESFORD asked the First Lord of the Admiralty when the report upon the Medical Department of the Navy would be presented to the House.—Mr. MCKENNA, in a written reply, answered: There are financial considerations involved which the Admiralty cannot settle without further authority. When this has been obtained it is hoped at no distant date that the preparation of a Blue-book containing such portions of the report as can properly be published will be proceeded with.

THURSDAY, JUNE 30TH.

The Fees of Vaccination Officers.

Mr. STAVELEY-HILL asked the President of the Local Government Board whether he was aware that boards of guardians had not accepted his advice to grant gratuities to vaccination officers to make up for the loss of income caused by the increased number of exemption certificates granted and to increase the fees where the deficiency was likely to be permanent; and whether he proposed to take any further action with the object of bringing the matter to a satisfactory settlement.—Mr. BURNS replied: The statement in the first part of the question is hardly correct. In many cases boards of guardians have, with the sanction of the Local Government Board, compensated the vaccination officer for loss of income by granting gratuities and by raising the fees. If any cases of hardship arise and they are brought to my notice by the vaccination officer I shall be prepared to consider them and to take such action as may be practicable.

The Medical Profession and the Petrol Tax.

Mr. COURTHOPE asked the Chancellor of the Exchequer whether members of the medical profession who desired to claim the rebate of 1½d. per gallon upon the petrol used by them in their practice were required to attend at the office of an officer of Customs and Excise in order to sign the requisite declaration and produce the proofs necessary to satisfy the officer; and whether he would consider the possibility of allowing the rebate to be claimed in a less inconvenient manner.—Mr. HOBHOUSE (replying on behalf of Mr. LLOYD GEORGE) said: As a general rule it is thought desirable that applications for rebate of motor spirit duty should be signed in the presence of an official of the Customs and Excise Department, but officers are instructed not to insist upon this requirement in any case in which it would entail inconvenience to a claimant and where there is no doubt as to the correctness of the claim.

Mr. COURTHOPE: Has notice been given of this?—Mr. HOBHOUSE: Not yet. My attention has been called to it only by the honourable gentleman's question. I will undertake that it shall be circulated at a very early date.

The Examination of the Officers' Training Corps (Medical).

Dr. ADDISON asked the Secretary of State for War whether he could state why Whit-Monday was fixed as a day for the written examination for certificate A of the Officers' Training Corps (Medical), and whether, in view of the fact that many candidates were prevented attending because of the day fixed, he could see his way to appoint another day, so that candidates might have an opportunity of taking Certificate A in time to enter for the examination for Certificate B in November.—Mr. HALDANE replied: Examinations for Certificates A and B of the Officers' Training Corps are held simultaneously in all contingents upon dates which are arranged after consultation with the University and public school authorities to suit the convenience of the greatest number. It is understood that the last examination held on Whit-Monday interfered but little with the ordinary work of the universities. The proposal to hold an extra examination in medical subjects would involve a similar concession as regards all the other subjects, and in view of the extra labour and expense involved is not regarded as practicable.

Forthill Burying Ground.

Mr. CHARLES CRAIG asked the Chief Secretary to the Lord Lieutenant of Ireland whether the attention of the Local Government Board had been called to the overcrowded and insanitary condition of Forthill burying ground, Galway; in whom was the control of the burying ground vested; and whether he would call for a report from the medical officer of health as to the condition of the graveyard. —Mr. BIRRELL wrote in reply: In accordance with the undertaking given in my reply to a question on the same subject asked by the honourable Member on July 24th, 1907, the Local Government Board communicated with the Galway urban district council, in whom the control of the burial ground is vested. The medical officer of health did not consider that sufficient space existed for the opening of new graves, and the council informed the Board that no new graves had been opened for some years past, and that only those whose grave spaces or vaults had been reserved could claim a right to interment in the cemetery. No complaint has been received since 1907.

MONDAY, JULY 4TH.

The Notification of Pulmonary Phthisis in Scotland.

Mr. WILLIAM YOUNGER asked the Lord Advocate whether, in view of the small proportion of local authorities which had applied to have pulmonary phthisis included in the list of notifiable diseases, and of the fact that the circular of the Local Government Board of March 10th, 1906, pointed out that a system of notification was essential for the effective application of the Public Health Act to pulmonary phthisis, he would consider the advisability of making the notification of this disease compulsory throughout the country.—Mr. URE replied: Up to the present 74 local authorities, representing almost 50 per cent. of the total population of Scotland, have extended the provisions of the Infectious Diseases (Notification) Act, 1889, to pulmonary phthisis. The Local Government Board regards the progress made in this direction as very satisfactory. It will continue to urge on local authorities the advisability of extending the Notification Act to phthisis, but it does not think that such a measure as is indicated in the last part of the question is necessary or advisable meantime.

Mr. WILLIAM YOUNGER also asked the right honourable gentleman whether, in view of the fact that many local authorities had not yet taken any steps to carry out the recommendations of the Local Government Board, as suggested in the circulars of March 10th, 1906, and July 15th, 1908, in the latter of which it was stated that the obligation resting on local authorities to deal with pulmonary phthisis had become more imperative, he would take steps to compel such local authorities to fulfil their obligations towards sufferers from phthisis within their districts.—Mr. URE answered: I am informed that the Local Government Board continues to press on local authorities the necessity for action in dealing with this question and to warn them of their responsibilities in the matter; that in most districts preventive measures of some kind are in operation; and that the Board proposes shortly to issue a further circular on the subject.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

ANDERTON, W. B., M.B. Lond., has been reappointed Pathological Registrar to the Royal Infirmary, Manchester.

BARTON, A. B., M.B., B.Ch. Edin., has been appointed Assistant House Physician at the Bristol General Hospital.

BUCK, HOWARD, M.B., Ch.B. Vict., has been reappointed Surgical Registrar to the Royal Infirmary, Manchester.

DOUGLAS, W. R., M.B., Ch.B. Vict., has been appointed Assistant Surgical Officer to the Royal Infirmary, Manchester.

GILROY, E. W., M.D. Durh., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Hemel Hempstead District of the county of Hertford.

GREATOREX, R. W., M.B., Ch.B. Edin., has been appointed Casualty Officer to the Bristol Royal Infirmary.

HARLAND, G. B., M.B., B.S. Lond., has been appointed House Physician at the Bristol Royal Infirmary.

HELE, THOMAS SHIRLEY, M.B., B.C. Cantab., M.R.C.S., L.R.C.P. Lond., has been appointed House Surgeon at the Bristol Royal Infirmary.

JONES, J. A., L.S.A., has been appointed House Physician to the Royal Infirmary, Manchester.

JORDAN, ANSON ROBERTSON, M.B., B.C. Cantab., has been appointed House Physician at the Bristol Royal Infirmary.

KENNEDY, R. FOSTER, M.B., B.Ch. R.U.I., has been appointed Assistant Physician to the Neurological Institute of New York, U.S.A.

KINGSTON, S. H., L.R.C.P. Lond., M.R.C.S., has been appointed Resident Officer to the Ear, Nose, and Throat Department at the Bristol Royal Infirmary.

LAVERTY, T., M.B., B.S. R.U.I., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Rathfriland District of the county of Down.

LYALL, C. H. GIBSON, L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed Senior Assistant Medical Officer at the Leicester Borough Asylum.

MACALPINE, J. R., M.B., Ch.B. Vict., has been appointed Medical Officer at the Central Branch of the Royal Infirmary, Manchester.

MALHERBE, S. E., M.B., B.Ch. Edin., has been appointed Casualty House Surgeon at the Bristol General Hospital.

MOISER, L. H., M.B. Lond., has been appointed Medical Officer of Health for the Crediton (Devon) Rural District.

NICHOLS, F. C., L.R.C.P. Lond., M.R.C.S., L.D.S. Eng., has been appointed Honorary Dental Surgeon to the Bristol Royal Infirmary.

OSMOND, CHARLES HOLDWAY, L.F.P.S. Glasg., L.S.A. Lond., has been appointed Honorary Dental Anæsthetist to the Bristol Royal Infirmary.

PARKER, W. P. H., L.R.C.P. & S. Irel., has been appointed Assistant Medical Officer to the Barnes Convalescent Home, Cheadle.

PETERS, BENJAMIN ALFRED, M.B., B.C., D.P.H. Cantab., has been appointed Resident Medical Officer at the Ham Green City Hospital, Bristol.

PILLIET, MARY AMELIA, M.B., Ch.B., has been appointed a Woman Inspector by the London County Council under the Midwives Act.

QUINLAN, W. T., L.R.C.P. Lond., M.R.C.S., has been appointed House Physician at the Bristol General Hospital.

ROBERTSON, D., M.B., B.Ch. Edin., has been appointed House Surgeon at the Bristol General Hospital.

SALISBURY, H. K., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer to the Clifton (Bristol) Dispensary.

SPARK, PERCY CHARLES, M.R.C.S., L.R.C.P. Lond., has been appointed Medical Superintendent at Banstead Asylum.

THOMAS, ROBERT EVANS, M.B., B.S. Lond., L.R.C.P. Lond., M.R.C.S., has been appointed Resident Obstetric Officer at the Bristol Royal Infirmary.

THOMPSON, ALEXANDER DEY, M.B., Ch.B. Glasg., has been appointed Medical Superintendent of the County Asylum, Cambridge.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

ARLESEY, NEAR HITCHIN, THREE COUNTIES ASYLUM.—Medical Superintendent. Salary £800 per annum, with residence, &c.

BEDFORD COUNTY HOSPITAL.—House Physician. Salary £60 per annum, with apartments, board, and washing.

BIRMINGHAM, QUEEN'S HOSPITAL.—House Physician; also House Surgeon. Salary at rate of £50 per annum, with board, lodging, and washing.

BIRMINGHAM, YARDLEY-ROAD SANATORIUM FOR CONSUMPTIVES.—Resident Medical Officer. Salary £150 per annum, with board and residence.

BRADFORD CHILDREN'S HOSPITAL.—House Surgeon. Salary £100 per annum.

BRADFORD ROYAL INFIRMARY.—Two House Surgeons, unmarried. Salary £100 per annum, with board, residence, and washing.

BRISTOL ROYAL INFIRMARY.—Honorary Medical Registrar.

BROOKWOOD ASYLUM, Knaphill, near Woking, Surrey.—Medical Superintendent. Salary £800 per annum, with house, rates and taxes, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £30 per annum, with board, residence, and laundry.

CAMBRIDGE, CAMBRIDGESHIRE LUNATIC ASYLUM, Fulbourn.—Senior Assistant Medical Officer, unmarried. Salary £150 per annum, with board, lodging, and washing.

CANCER HOSPITAL, Fulham-road, London, S.W.—Surgeon.

CARDIFF INFIRMARY (GENERAL HOSPITAL).—House Surgeon for Ophthalmic and Ear and Throat Departments for six months. Salary £30, with board, residence, and laundry.

CARDIFF, UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE.—Lecturer in Histology and Embryology. Salary £200 per annum.

CENTRAL FOUNDATION SCHOOLS OF LONDON, Boys' School, Cowper-street, City-road, E.C.—Medical Officer. Salary £50 per annum.

CHESTER COUNTY ASYLUM.—First Assistant Medical Officer. Salary £250 per annum, with board, lodging, and washing.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—Junior House Surgeon. Salary £60 per annum, with board, apartments, and laundry.

CROYDON GENERAL HOSPITAL.—Junior House Surgeon. Salary £60 per annum, with board, laundry, and residence.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—Assistant House Surgeon for six months. Salary £30, with board, residence, and washing.

GLASGOW SCHOOL BOARD.—Assistant Medical Officer (female). Salary £250 per annum.

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—Assistant House Surgeon. Salary £50 per annum, with board, residence, and laundry.

HIGHBURY HILL HIGH SCHOOL FOR GIRLS.—Female Practitioner. Salary £50 per annum.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Dental Surgeon. Salary 50 guineas per annum. Also House Physician for six months. Salary 30 guineas.

HOSPITAL FOR WOMEN, Soho-square, W.—Resident Medical Officer for six months. Salary £60 per annum. Also Pathologist and Registrar. Salary £100 per annum.

HULL ROYAL INFIRMARY.—Two Casualty House Surgeons. Salary £80 per annum, with board and lodging.

ISLINGTON, PARISH OF ST. MARY.—District Medical Officer for Nos. 5 and 8 Relief Districts. Salary £85 per annum.

KIDDERMINSTER INFIRMARY AND CHILDREN'S HOSPITAL.—House Surgeon. Salary £100 per annum, with board and residence.

LINCOLN COUNTY HOSPITAL.—Junior House Surgeon, unmarried, for six months. Salary at rate of £75 per annum, with board, residence, and washing.

LONDON HOSPITAL, Whitechapel, E.—Assistant Surgeon.

LONDON SKIN HOSPITAL, 40, Fitzroy-square.—Honorary Assistant Physician.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Resident Medical Officer. Salary £120 per annum, with board, residence, and washing. Also Assistant House Surgeon for six months. Salary at rate of 100 guineas per annum.

MANCHESTER CHILDREN'S HOSPITAL, Gartside-street, Manchester.—Assistant Medical Officer for six months. Salary £100 per annum.

MANCHESTER ROYAL INFIRMARY.—House Surgeon for six months. Salary £100 per annum, with board and residence.

METROPOLITAN ASYLUMS BOARD, London.—Assistant Bacteriologist. Salary £300 per annum.

METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL, Grafton-street, Tottenham Court-road, W.—Surgeon.

NEWCASTLE, CO. WICKLOW, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION FOR IRELAND.—Senior Resident Medical Officer. Salary £300 per annum, with house accommodation.

NOTTINGHAM GENERAL HOSPITAL.—Assistant House Surgeon. Also Assistant House Physician. Salary in each case £100 per annum, with board, lodging, and washing.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—Honorary Dental Surgeon.

POPLAR HOSPITAL FOR ACCIDENTS, Poplar, E.—Assistant House Surgeon for six months. Salary at rate of £80 per annum, with board and residence.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—Pathologist. Salary £20 per annum.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, residence, and washing.

ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN.—Junior Resident Medical Officer. Salary at rate of £40 per annum, with board and washing.

SALISBURY, FISHERTON HOUSE ASYLUM.—Assistant Medical Officer, unmarried. Salary £150 per annum, with board, lodging, and washing.

SCARBOROUGH HOSPITAL AND DISPENSARY.—Junior House Surgeon for six months. Salary £80 per annum, with board, residence, and laundry.

SHEFFIELD EDUCATION COMMITTEE.—Assistant Medical Officer. Salary £250 per annum.

SHEFFIELD ROYAL HOSPITAL.—Assistant House Surgeon and Assistant House Physician, unmarried. Salary £50 each per annum, with board, lodging, and washing. Also Casualty Officer. Salary £60 per annum.

SHEFFIELD ROYAL INFIRMARY.—Seventh Resident Medical Officer. Salary £80 per annum, with board and residence.

SOUTHWARK UNION INFIRMARY, East Dulwich-grove, S.E.—Assistant Medical Officer. Salary £100 per annum, with board, lodging, and washing.

STAMFORD, RUTLAND, AND GENERAL INFIRMARY AND FEVER HOSPITAL.—House Surgeon, unmarried. Salary £130 per annum, with board, lodging, and washing.

STOCKPORT INFIRMARY.—Junior House Surgeon. Salary £80 per annum, with board, washing, and residence.

SURREY COUNTY COUNCIL.—Assistant Medical Officer. Salary £250 per annum.

VENTNOR, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST ON THE SEPARATE PRINCIPLE.—Assistant Resident Medical Officer, unmarried. Salary £100 per annum, with board, lodging, &c.

WAKEFIELD, WEST RIDING ASYLUM.—Assistant Medical Officer. Salary £140 per annum, with apartments, board, washing, &c.

WARRINGTON INFIRMARY AND DISPENSARY.—Senior House Surgeon. Salary £120 per annum, with apartments, board, and laundry.

WEST HAM HOSPITAL, Stratford, E.—Junior House Surgeon. Salary at rate of £75 per annum, with board, residence, &c.

WINCHESTER, ROYAL HAMPSHIRE COUNTY HOSPITAL.—House Physician.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Act at Drogheda, in the county of Louth; and at Ross, in the county of Hereford.

Births, Marriages, and Deaths.

BIRTHS.

GRIFFITHS.—On July 4th, at St. Peter's-terrace, Cambridge, the wife of Dr. Joseph Griffiths, of a son.

WHITE.—On June 29th, at West Knoll, Bournemouth, the wife of Edward How White, M.B., of a daughter.

MARRIAGES.

LEDWARD—GIBB.—On June 28th, at St. Jude's, Tilstone Fearnall, Hugh Davenport Ledward, M.B., to Lilian Grace, youngest daughter of Walter Gibb, of Hilbre, Tarporley.

MCLEAN—BYRNE.—On Wednesday, July 6th, at All Saints, Fulham, by the Rev. W. C. Muriel, Vicar, William W. L. McLean, M.R.C.S., L.R.C.P. Lond., D.P.H., to Margaret, younger daughter of the late John Byrne, of King's County, and of Mrs. Byrne, 18, Landridge-road, Fulham Park-gardens, S.W.

SCOTT—PHILLIPS.—On June 30th, at Trinity Church, Hampstead, William Lochhead Scott, M.D., B.S., M.R.C.S., L.R.C.P., to Gwendolen Maud Lucy, daughter of the late Edward Nunes Phillips.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE CONDITION OF PALESTINE.

Mr. H. E. Satow, British Consul at Jerusalem, in his report for the year 1909, just issued from the Foreign Office, states that the population of that city is now about 80,000, of which number some 50,000 are Jews, mostly of the poorer class. There are 370 British subjects, of whom only about 140 are English-speaking. The epidemic of cerebro-spinal meningitis, which commenced in 1908, continued throughout 1909, but with decreased vigour. Towards the end of the year it had practically disappeared. The state of public health is, considering the squalid and filthy surroundings and habits of a considerable portion of the population, surprisingly good, although malaria and other diseases are always present. Schemes for the improvement of the water-supply have been mooted, but have as yet failed of realisation. Great importance is attached to the finding of some source of revenue which would suffice to provide the necessary guarantee for the cost of the works. It was hoped that this could be done by authorising the municipality to take the skins and offal of all animals slaughtered in the city, and an Imperial irade in that sense was issued, but it now appears doubtful whether the levying of such a tax in kind is practicable, and up to the present nothing has been done in that direction.—Mr. Vice-Consul Falanga reports that at Jaffa there has been a slight increase of population, quoted last year as 50,000 inhabitants for Jaffa and neighbouring German and Jewish colonies. The increase is due to the fact that the immigration of Jews from Russia, and to some extent from South Africa and Australia, continues. Were it not for the influx of foreigners the population would show a yearly decrease, as is the case with the surrounding villages inhabited only by natives. The causes are the neglect and carelessness of the parents in bringing up their children, which are left entirely to nature and consequently suffer from the effects of the climate. The sanitary condition of the town is completely neglected, with the result that there were many cases of malarial fever last autumn, affecting perhaps 50 per cent. of the inhabitants, who are also liable to other epidemic diseases.—The report of Mr. Knesevich, the British Agent at Gaza, is equally unsatisfactory. The population, he remarks, is approximately 70,000, including the inhabitants of the 60 surrounding villages. The sanitary state of the town is neglected; the streets are dirty, and nothing is done by the municipality towards the observation of cleanliness. The general health of the district during 1909 was much the same as in other years, with the exception of a severe epidemic of dengue fever, and the increase of the number of cases of malaria which generally occur every autumn. Small-pox visited Gaza in December. The most common diseases are those of the eye, malaria with its sequelæ, and the specific infectious diseases. Dysentery is also prevalent. The climate of Gaza is good and healthy, but the lack of all knowledge of hygiene on the part of the local government and of the people causes diseases to abound.

THE CENSUS AND CONSUMPTION.

To the Editor of THE LANCET.

SIR,—May I suggest, as the religious column in the enumeration papers at the next census is not to have a place, that one should be allotted to finding out the houses in which cases of consumption have occurred during the last few years. Then a great source of the spread of the complaint might be averted by disinfection of those houses; information being given to the medical officer of each district he might easily at least have a great many attended to. The present arrangement of the Poor-law medical officer giving notice of pauper patients does a very small amount of benefit, for during a period of 30 years I found that phthisis was much more prevalent in the classes above the agricultural labourer, such as small tradesmen and farmers. Indeed, I could trace in my small experience three houses infected from one of the latter class. Until houses are almost universally disinfected I fear individual treatment will be a long time in showing any great benefit to the people generally. As under the Census Act all information therein contained is strictly confidential I cannot see any objection in asking for the above information. I would suggest that a footnote be added to the column, "Asked for your own protection," or something of the kind. Might not this be considered in Committee?—I am, Sir, yours faithfully,

July 4th, 1910. A LATE REGISTRAR OF BIRTHS AND DEATHS.

MEMORIALS TO KING EDWARD VII.

THE opinion that the most suitable national memorial to the late King should take the form of a hospital is becoming widespread. Several local councils have decided to erect hospitals or sanatoriums in their districts. At a recent meeting of the Shropshire County Association the President announced that King George had consented to the erection of a Shropshire Consumption Sanatorium in memory of the late King. A first list of donations towards Birmingham's memorial to King Edward has been announced. The memorial is to consist of a statue and a new children's hospital. A sum of £1000 is given by Mr. W. Waters Butler, Mr. H. A. Butler, and Miss Nellie Butler to endow a bed in the children's hospital to the memory of their late father. A similar amount is contributed by Mr. George Cadbury and £1221 by Messrs. Mitchell and Butler. Mrs. E. A. Avins, Miss E. A. P. Avins, and Mr. J. A. Kenrick have given £500 each. At Ipswich a largely attended public meeting carried heartily a resolution declaring a sanatorium for consumption to be a fitting memorial to the late King. The resolution was proposed by Alderman W. F. Paul, who stated his generous intention of adding 50 per cent. to all money collected for the sanatorium up to the sum of £10,000. A resolution requesting the mayor, Mr. A. Gibb, to invite subscriptions was not only carried but supported by promises of £2500.

CLEAN BREAD.

THE clean handling of bread is attracting the columns of the lay press. We observe that our contemporary, the *Evening News*, devoted much attention last week to the subject, quoting letters from medical men and writing a leading article on the subject. We have many times called attention to the clean handling of bread in our columns, and we agree that bread should be treated with as much respect as is milk nowadays, and until this is done we can only say in the words of the prophet Ezekiel, "Son of man, eat thy bread with quaking, and drink thy water with trembling and with carefulness."

WANTED, A STANDARD FOR TEA.

To the Editor of THE LANCET.

SIR,—Why is tea not standardised? We all know, approximately, the composition of milk, or bread, or eggs, or ipecacuanha, or whisky, but of "the infusion of this fascinating plant," as Dr. Johnson would say, we may have a cloud of theories, but we only know that it contains theine, tannin, some essential oil, and other noteless ingredients. What one wants to know is, how much theine is present? Is it 1 per cent. or less, is it 2 or 3 per cent. or more? I do not seek for accuracy, but when a physician prescribes or forbids the administration of an important alkaloid like caffeine or theine he ought, I submit, to have some notion of the quantity in question—at least, within 200 or 300 per cent. Of course, I may be told that the chemical constituents of tea form no reliable index to its value, that the tea-tester alone is the judge of quality. I demur against this view, *De gustibus non disputandum sit.* The tea-taster may be the best judge of what suits the public palate, but to the physician the value of tea or coffee must be directly as their caffeine content, and inversely perhaps as to the tannin present.

I am not prepared to argue that the physiological effect of a couple of grains of caffeine in a cup of hot water must be quite the same as that of a cup of tea, yet I do believe that, other things being equal, the value of different samples of tea depends on the proportion of theine rather than anything else; hence we might be furnished with some information as to the proportion of the alkaloid available in each sample. I am, Sir, yours faithfully,

Dublin, June 24th, 1910. J. C. MCWALTER, D.P.H., M.D. Brux.

THE SUPPLY OF RADIUM.

MANY newspapers recently drew attention to the difficulty of obtaining an adequate supply of radium for research purposes as a preface to a flamboyant statement that "the world's entire supply of radium has been secured for Great Britain," the said supply being derived from uranium deposits discovered in the district of Guarda, Portugal, the various pitchblende mines in Bohemia and other countries being left entirely out of consideration. A paragraph stating that owing to this discovery Great Britain will now have preferential facilities in the treatment of cancer has brought us a good deal of correspondence, but we have no information to give on the matter. It does not seem to follow that because uranium is discovered by an Englishman the supply belongs to this country.

THE DEAF-MUTES OF RUSSIA.

A WRITER in the *Novoe Vremya*, in describing a ball at the Imperial Deaf and Dumb School, after referring to the manner in which the inmates danced to the rhythm of the music communicated through the floor, says that there are over 200,000 deaf-mutes in Russia. There are only four educational establishments for these unfortunates: one in the Vladimir Monastery, Moscow, another in Warsaw, and a new one, a private establishment, in Alexandroff (Ekaterinoslav government).

It is now 30 years, says the writer, since verbal teaching was substituted for signs, but these have now been entirely abandoned in Russia. German specialists say that deaf-mutes prefer mimicry; since under the coarse *régime* of the German educational system the unsuccessful are beaten, therefore the pupils prefer the simpler method as it means fewer cuffs. But, continues the writer, whilst the German deaf-mute children are weak and depressed, Russian mutes are strong and full of vigour. There is an immense difference between the sign and word systems. There are only 600 signs, so that the scope for mental development is very limited. The present master

of the Imperial Deaf and Dumb School, Mr. Enko, is to be credited with the latest development in the method of teaching deaf-mutes. He has discovered a way of teaching them to read of, and apprehend, things they are not acquainted with. Pupil and guide compose elementary books with very simple tales which the other pupils are able to read and understand. In the senior classes they are reading the newspapers and literature of a higher order. Mr. Enko is arranging for the education of isolated deaf-mutes in the country. Special allowances will be made to teachers who undertake such work at so much per pupil. These teachers will have themselves to go through a course of special training for a few months in St. Petersburg.

WORKMEN'S COMPENSATION ACT: THE LOCUM TENENS QUESTION.

Dr. Stanley Yeoman asks if 10s. is the usual insurance premium under the Workmen's Compensation Act to be paid in the case of a locum-tenent. He considers that, if it is, the locum-tenent must be very well insured, considering the short time he is at each place; and he would like to know what other medical men are doing in the matter. 10s. is the premium charged by the Medical Insurance Committee, 429, Strand, W.C., through the Guardian Assurance Company, but this 10s. covers any number of medical assistants and locum-tenents in the course of 12 months, up to a total of £100 paid in salaries.

A CONVALESCENT HOSPITAL'S JUBILEE.

ERECTED in 1860, the Seaside Convalescent Hospital at Seaford, in Sussex, was the first institution of the kind to be opened. Since that time there have been many kindred institutions erected here and there, all of which make their demands upon the charitably disposed. The claims of some of the older institutions are inclined to be forgotten with new ones springing up so rapidly, and every opportunity has to be taken to keep them in the public eye, as it were. The Seaford institution is one of these, but the celebration of the jubilee on June 18th was taken advantage of by the committee to draw attention to the need of further interest and increased support. The institution can claim a remarkable record. No fewer than 31,000 patients have been received during the 50 years and during the whole of this period there have only been 12 deaths. This is a tribute indeed, not only to the suitability of Seaford for such an institution but also to the medical and nursing staffs. The jubilee was celebrated by a reception held by Viscountess Gage, who presented the present patients with a photograph of the hospital as a souvenir of the occasion. A jubilee fund has been opened with the hope of raising the necessary money so that there may be no curtailment of the work of the institution.

COMMUNICATIONS not noticed in our present issue will receive attention our next.

A DIARY OF CONGRESSES.

CONGRESSES are now getting so numerous that we have thought that a diary like the one printed below might be of service to our readers. With that idea we shall repeat it occasionally, with any necessary additions or subtractions. The following Congresses, Conferences, and Exhibitions are announced for 1910:—

July 11th–14th (London).—Parents' National Educational Union.
" 18th–23rd (Birkenhead).—Royal Institute of Public Health.
" 26th–29th (London).—British Medical Association.
" 26th–29th (Cambridge).—Pharmaceutical Congress.
August 1st–7th (Brussels and Liège).—Congress of French-speaking Psychiatrists and Neurologists.
" 2nd–7th (Paris).—Third International Congress on School Hygiene.
" 4th–10th (Brussels).—International Congress of Legal Medicine.
" 21st–26th (Brussels).—International Home Education Congress.
" 31st (Sheffield).—British Association for the Advancement of Science.
Sept. 10th–14th (Brussels).—Second International Congress on Occupational Diseases.
" 13th–15th (Brussels).—International Congress on Radiology and Electricity.
" 22nd–27th (Toulouse).—Sixth French Congress of Gynæcology, Obstetrics, and Pædiatrics.
" 22nd–28th (St. Petersburg).—Fifth International Congress of Obstetrics and Gynæcology.
" 27th–30th (Vienna).—Eighth International Physiological Congress.
Oct. 1st–5th (Paris).—Second International Conference for the Study of Cancer.
" 3rd–7th (London).—Sixth London Medical Exhibition.
" 3rd–7th (Berlin).—International Congress on the Care of the Insane.
" 4th–8th (Brussels).—Second International Congress of Alimentary Hygiene.
" 13th–15th (Paris).—Eleventh French Congress of Medicine.
" 16th–22nd (Barcelona).—First International Spanish Congress of Tuberculosis.

In 1911:—
May–October (Dresden).—International Hygiene Exhibition.
August or September (Berlin).—Third International Laryngo-Rhinological Congress.
September (Brussels).—Exhibition of Fractures.
October (Cologne).—International Congress of Criminal Anthropology.

In 1912:—
September (Washington, D.C.).—Fifteenth International Congress of Hygiene and Demography.

In 1913 the only fixture so far is in London, where the Seventeenth International Congress of Medicine will take place.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.

MONDAY.—4 P.M., Dr. J. M. H. MacLeod: Clinique (Skin). 5.15 P.M., Lecture:—Dr. E. Wynter: The Local Application of Salicylates.
TUESDAY.—4 P.M., Dr. N. Pitt: Clinique (Medical). 5.15 P.M., Lecture:—Mr. E. M. Corner: Appendicitis in Children.
WEDNESDAY.—4 P.M., Mr. M. White: Clinique (Surgical). 5.15 P.M., Lecture:—Mr. C. A. R. Nitch: Modern Methods of Diagnosis in the Surgery of the Urinary Organs.
THURSDAY.—4 P.M., Dr. G. Stewart: Clinique (Medical). 5.15 P.M., Lecture—Dr. W. Carr: The Diagnosis and Prognosis of Acute Pneumonia.
FRIDAY.—4 P.M., Dr. G. Thompson: Clinique (Eye).

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—10 A.M., Lecture:—Surgical Registrar: Demonstration of Cases in Wards. 12 noon, Pathological Demonstration:—Dr. Bernstein. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. 2.30 P.M., Mr. Dunn: Diseases of the Eye. 5 P.M., Lecture:—Mr. Baldwin: Practical Surgery (Lecture VI.).
TUESDAY.—10 A.M., Dr. Moullin: Gynæcological Operations. 11.30 A.M., Demonstrations in Minor Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Mr. Pardoe: Difficult Micturition and Retention of Urine.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. 12.15 P.M., Lecture:—Dr. G. Stewart: Practical Medicine. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Mr. B. Harman: Diseases of the Eye. 2.30 P.M., Dr. Robinson: Diseases of Women. 5 P.M., Lecture:—Dr. Beddard: Practical Medicine (Lecture V.).
THURSDAY.—10 A.M., Lecture:—Surgical Registrar: Demonstration of Cases in Wards. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Mr. Dunn: Diseases of the Eye. 5 P.M., Lecture:—Mr. Dunn: Ocular Pain, its Variety and Treatment.
FRIDAY.—10 A.M., Dr. Moullin: Gynæcological Operations. Medical Registrar: Demonstration of Cases in Wards. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Mr. R. Smith: Clinical (Lecture II.).
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Diseases of the Eye. 2 P.M., Medical and Surgical Clinics. X Rays. Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10 A.M., Surgical Out-patient (Mr. Howell Evans), 2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Nose, Throat, and Ear (Mr. H. W. Carson).
TUESDAY.—Clinic: 10 A.M., Medical Out-patient (Dr. A. G. Auld). 2.30 P.M., Operations. Clinics:—Surgical (Mr. W. Edmunds); Gynæcological (Dr. A. R. Giles). 3.30 P.M., Medical In-patient (Dr. A. J. Whiting).
WEDNESDAY.—Clinics:—2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Skin (Dr. G. N. Meachen); Eye (Mr. R. P. Brooks). 3 P.M., X Rays (Dr. A. H. Pirie).
THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. R. Giles). Clinics:—Medical Out-patient (Dr. A. J. Whiting); Surgical (Mr. Carson). 3 P.M., Medical In-patient (Dr. G. P. Chappel).
FRIDAY.—2.30 P.M., Operations. Clinics:—Medical Out-patient (Dr. A. G. Auld); Eye (Mr. R. P. Brooks). 3 P.M., Medical In-patient (Dr. R. M. Leslie).

LONDON SCHOOL OF CLINICAL MEDICINE, Dreadnought Hospital, Greenwich.

MONDAY.—2 P.M., Operations. 2.15 P.M., Mr. Turner: Surgery. 3.15 P.M., Sir Dyce Duckworth: Medicine. 4 P.M., Mr. R. Lake: Ear and Throat. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat.
TUESDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Wells: Medicine. 3.15 P.M., Mr. R. Carling: Surgery. 4 P.M., Sir M. Morris: Diseases of the Skin. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.
WEDNESDAY.—2 P.M., Operations. 2.15 P.M., Dr. F. Taylor: Medicine. 3.30 P.M., Mr. Cargill: Ophthalmology. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.
THURSDAY.—2 P.M., Operations. 2.15 P.M., Dr. G. Rankin: Medicine. 3.15 P.M., Sir W. Bennett: Surgery. 4 P.M., Dr. Sale-Barker: Radiography. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat.
FRIDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Bradford: Medicine. 3.15 P.M., Mr. McGavin: Surgery. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.
SATURDAY.—2 P.M., Operations. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

HOSPITAL FOR SICK CHILDREN (UNIVERSITY OF LONDON), Great Ormond-street, W.C.

MONDAY.—5.15 P.M., Dr. A. Voelcker: Diseases of the Chest in Children, illustrated by cases, specimens, skiagrams, and drawings. (Lecture I.). (Post-graduate Course.)

TUESDAY.—5 P.M., Mr. H. G. T. Fairbank: Deformities, illustrated by cases, specimens, skiagrams, and sketches. (Lecture I.). (Post-graduate Course).

WEDNESDAY.—5.15 P.M., Dr. A. Voelcker: Diseases of the Chest in Children, illustrated by cases, specimens, skiagrams, and drawings. (Lecture II.). (Post-Graduate Course.)

THURSDAY.—4 P.M., Lecture:—Mr. Fairbank: Lymphatic Glandular Enlargements.—5 P.M., Mr. H. G. T. Fairbank: Deformities, illustrated by cases, specimens, skiagrams, and sketches. (Lecture II.). (Post-graduate Course).

CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn-road, W.C.

TUESDAY.—3.45 P.M., Lecture:—Dr. A. Wylie: Larynx.
FRIDAY.—3.45 P.M., Lecture:—Dr. Atkinson: Nose.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (11th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M.), St. Mark's (2.30 P.M.), Central London Throat and Ear (Minor 9 A.M., Major 2 P.M.).

TUESDAY (12th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St.-Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M., Ophthalmic, 2 P.M.), Tottenham (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

WEDNESDAY (13th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

THURSDAY (14th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M.), Tottenham (Gynæcological, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

FRIDAY (15th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2.30 P.M.), St. Peter's (2 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

SATURDAY (16th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 A.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M.), West London (2.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

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Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

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MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

The Index and Title-page to Vol. I. of 1910, which was completed with the issue of June 25th, were given in THE LANCET of July 2nd.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1910 will be ready shortly. Bound in cloth, gilt lettered, price 16*s.*, carriage extra.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, July 6th, 1910.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
June 30	29·52	W.	0·07	113	65	52	53	57	Cloudy
July 1	29·70	W.	0·20	119	64	53	54	57	Cloudy
,, 2	29·62	W.	0·19	110	65	53	54	58	Raining
,, 3	29·65	W.	0·24	125	61	51	52	56	Cloudy
,, 4	29·97	N.W.	0·31	119	67	51	53	57	Cloudy
,, 5	30·07	N.W.	...	111	67	53	55	60	Cloudy
,, 6	29·64	N.W.	0·57	119	62	58	59	61	Cloudy

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